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THE PRESENT STATUS OF IDIOPATHIC ULCERATIVE COLITIS

WITH ESPECIAL REFERENCE TO ETIOLOGY

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BALTIMORE

Any involvement, regional or general, of the large intestine above the lower part of the rectum resulting in a sanguineous, a mucosanguineous, a mucopurulent or a mucopurulent-sanguineous exudate, with or without diarrhea, due to known or unknown factors, save that of a neoplasm, is a colitis. Clinically, the corollary follows that a colonic exudate or feces containing blood, mucoblood or pus, or all of them, is due to a colitis when neoplastic disease and perianal, perirectal and localized disturbances of the hemorrhoidal area are eliminated as causes.

This communication concerns itself with a form of colitis known as idiopathic, primary, nonspecific, ulcerative, chronic ulcerative, hemorrhagic or suppurative colitis, colitis gravis, ulcerosa or ulcereuse.

ETIOLOGIC CONSIDERATIONS

General Prevalence.—This syndrome is not restricted to age, sex, season or zone. The greatest number of cases fall within the second, third and fourth decades.

Epidemiology.—Idiopathic ulcerative colitis possesses neither epidemic nor infective properties. Its lack of transmissibility is striking. The records of the Johns Hopkins Hospital do not reveal more than one case in a family.

Predisposing Factors, So Called.—Nothing definite is known in this connection. "Predisposing factors," so called, when associated with ulcerative colitis, is a term used to denote the relative concomitance of initial symptoms and exacerbations with other factors. They have been designated as infections of the upper respiratory tract, epidemic diarrhea (in all likelihood bacillary dysentery), or diarrhea following the drinking of polluted water, as well as amebic dysentery, and so-called factors acting locally by reducing bowel resistance in the form of enemas and laxatives.[1] Similarly, the psychiatric aspects, probably because of the occurrence of ulcerative colitis in some young men and women of psychoneurotic or emotionally unstable tendencies, have come into consideration of late.[2]

It is my belief that, when some powerful systemic or other agent, as noted, is called in aid or is regarded as of etiologic significance, the intestinal flora or a so-called specific organism cannot be regarded as either a sole or a primary cause of the lesion seen in ulcerative colitis.

Parasitology.—The very definition of the syndrome of idiopathic ulcerative colitis precludes the presence of pathogenic parasites. Yet the simultaneous appearance of amebic dysentery and ulcerative colitis has been claimed to occur as distinct entities in some cases by virtue of the concomitant occurrence of three conditions: (1) the isolation of Endamoeba histolytica, (2) the feeling that the etiology of ulcerative colitis has been ascertained, and (3) the presence of types of ulceration seen by rectosigmoidoscopy, said to be characteristic for each of these conditions. That these two disturbances may occur simultaneously does not involve the acceptance of the interpretation that has been given, for these reasons: First, the specific etiologic factor in ulcerative colitis—as will be indicated—remains undetermined. Second, rectosigmoidoscopic observations described as characteristic of this disorder are to others,[3] including myself, indistinguishable from chronic bacillary dysentery. In consequence, it would seem to be in error to deviate from the accepted teaching, namely, that the infection by E. histolytica be regarded as primary and the involvement of ulcerative colitis as secondary. Incidentally, those cases in which after adequate treatment the parasite disappears but the colitis persists fall, in my opinion, within this group. This conservative attitude, it is felt, should likewise apply in the conceivable possibility of the engrafting of an amebic dysentery on a preexisting ulcerative colitis when it is impossible for the clinician, as it must be in practically all such instances, to determine the priority of disorder. If Craig's complement fixation test for amebiasis should prove to be significant, some cases diagnosed as primary ulcerative colitis are those of amebic dysentery or secondary to that disease. This phase of the problem has been brought forth recently by Kiefer.[4]

The presence of other amebas in ulcerative colitis is not particularly significant, since they are not disease

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Owing to lack of space, this article has been abbreviated in THE JOURNAL principally by the omission of general anatomic, physiologic and clinical considerations. The complete article appears in the author's reprints.

Read before the Section on Gastro-Enterology and Proctology at the Eighty-Fourth Annual Session of the American Medical Association, Milwaukee, June 14, 1933, and the Greater Boston Medical Society, Boston, Oct. 3, 1933.

1. Larson, L. M.: Predisposing Factors in the Etiology of Chronic Ulcerative Colitis, Proc. Staff Meet., Mayo Clin. **6**: 241-244 (April 22) 1931.

2. Murray, C. D.: Psychogenic Factors in the Etiology of Ulcerative Colitis and Bloody Diarrhea, Am. J. M. Sc. **180**: 239-248 (Aug.) 1930. Sullivan, A. J., and Chandler, C. A.: Ulcerative Colitis of Psychogenic Origin, Yale J. Biol. & Med. **4**: 789-796 (July) 1932.

3. (*a*) Hurst, A. F.: Discussion on Diagnosis and Treatment of Colitis, Proc. Roy Soc. Med. (Sect. Med.) **20**: 1-4, 1927; Discussion on Colitis, ibid. (Sect. Surg.) **16**: 106-108, 1922-1923; Discussion on Colitis, ibid. **24**: 784-797, 1931. (*b*) Herr, J. B.: Ulcerative Colitis, Guy's Hosp. Rep. **81**: 322-373, 1931.

4. Kiefer, E. D.: The Craig Complement Fixation Test for Amebiasis in Chronic Ulcerative Colitis, Am. J. M. Sc. **183**: 624-631 (May) 1932.

producing. This is true, too, of the flagellates—even though medical literature sometimes may lead one to believe to the contrary — for parasitologists have deduced no satisfactory scientific evidence of pathogenicity. There are data to show that Balantidium coli —the ciliate—may produce an ulcerative colitis;[5] but it is not the type with which we are concerned here.

Bacteriology.—A. Uncommon Bacterial Types: B. proteus, B. pyocyaneus, B. lactis-aerogenes and B. mucosus-capsulatus have been incriminated as etiologic agents in chronic ulcerative colitis.[6] Actually, no satisfactory evidence has been adduced that any of these organisms bear any essential relation to this condition.[6a] B. paratyphosus B[7] has been isolated on occasion from intestinal lesions in some cases of ulcerative colitis and has therefore been regarded in those instances as a significant factor in etiology.

B. Anaerobes: There appears in the literature no satisfactory direct evidence for the belief that B. welchii is of etiologic significance in ulcerative colitis. Felsen's[8] report of satisfactory clinical responses by intestinal oxygenation does not prove the importance of this bacterium in the etiology of this condition, for he himself suggests that the effect of such therapy may be on intestinal tissue proper. Contrarywise, in my studies on ulcerative colitis, I have been impressed with the relative fewness of B. welchii generally encountered on anaerobic deep blood agar plates made directly from the material of these cases. Also, I[9] have found, in vitro, that fresh, noncoagulable blood in normal as well as from ulcerative colitis cases has a deleterious effect on B. welchii. This might explain why this organism is not found in large numbers and therefore is at present not to be regarded as the cause of the condition.

C. Virulence Ascribed to Normal Bacterial Inhabitants of the Colon: There are some observers who present the idea that, for some unexplainable reason, the local tissue resistance of the colon becomes lowered, and organisms that are habitual saprophytes take on an added virulence and become pathogenic. This has been well expressed by Dr. T. R. Brown,[10] chief of the Gastro-Intestinal Clinic at Johns Hopkins Hospital, in the following manner:

> Is it not possible that the cause of the disease is to be found not in the presence of a definite and specific infective agent, but rather in the absence of some protective substance or mechanism, or of something which normally inhibits the bacterial invasion of the intestinal wall, perhaps due to metabolic error, or endocrine disturbance or lack of a specific bacteriophage, or absence of some normal bactericidal substance in the intestinal mucosa?

D. B. Coli: There is no convincing experimental evidence on record that B. coli is of primary significance in the etiology of the process. I[9] have recently deduced suggestive confirmation of this view. From experiments in vitro in undiluted blood and in saline-blood dilutions from both normal and ulcerative colitis cases, this organism is destroyed and its growth inhibited, respectively.

E. B. Dysenteriae: The view that chronic ulcerative colitis is an aberrant form of bacillary dysentery persists in England,[3] on the continent,[11] in Canada[12] and, possibly to a lesser extent, in this country. Ulcerative colitis appears to differ from bacillary dysentery in four particulars. First, ulcerative colitis is not known to present the abrupt, brief attack of the ordinary case of bacillary dysentery. Second, the age incidences are dissimilar. Third, ulcerative colitis is not infective. Fourth, in ulcerative colitis, B. dysenteriae is not encountered.

The first two difficulties are explained principally by Hurst and his co-workers by the hypothesis that ulcerative colitis is a modified form of bacillary dysentery. Actually, this may or may not be so, or the contention may be true only of a group of cases which may have begun as bacillary dysentery but which, when investigated, are diagnosed as idiopathic ulcerative colitis because of negative bacteriologic, parasitologic and serologic observations. As to the third objection, while ulcerative colitis is noninfective in that almost never are two cases found in the same household, recurring or chronic bacillary dysentery with which it is comparable is regarded in many quarters as being noninfective, too, especially when the offending organism, rarely isolated in this condition, is not to be encountered. Fourthly, the bacteriology and serology of ulcerative colitis and that of recurring bacillary dysentery are not as dissimilar as would appear at first glance. In ulcerative colitis, B. dysenteriae is not to be found. In chronic bacillary dysentery these organisms are rarely to be encountered; their paucity, when discovered, and the severity of the disease are such that the causal relationship of these bacteria to the lesion of chronic dysentery is somewhat incredible. In ulcerative colitis, the serum agglutination reactions with B. dysenteriae are negative; in a majority of definitely established subacute and chronic bacillary dysenteries, Douglas, Colebrook and Morgan[13] have shown that the serum agglutination reactions are of no diagnostic import. Some authorities deny the occurrence of agglutination altogether.[3b] De Lavergne and others[14] demonstrated in Flexner dysentery a relationship between the diminution of agglutination properties and the increase of time elapsing between the onset of the attack and the performing of the agglutination test. Incidentally, here it is to be observed that many cases finally diagnosed as chronic ulcerative colitis are studied intensively for the first time years after the initial attack. Thus, it is possible that the differences between chronic ulcerative colitis and chronic bacillary dysentery may be quantitative and not qualitative, at least in some cases.

Recently, I[9] learned that in undiluted and in dilutions of noncoagulable human blood (1 cc. of blood to 3 cc. of saline solution) in normal and bacillary dysentery cases, B. dysenteriae Shiga and Flexner failed to survive on incubation at 37 C.; in bouillon controls they grew abundantly. The experiments suggested that the

5. Boeck, W. C.: Intestinal Flagellates and Ciliates of Man, in Oxford Medicine, 1932, chapter XLII, pp. 1040-1043.

6. Jex-Blake, A. J., and Higgs, F. W.: Statistics of Ulcerative Colitis, Proc. Roy. Soc. Med. (Sect. Med.) **2**: 119-124, 1908-1909.

6a. It was learned later[9] that B. mucosus-capsulatus and B. pyocyaneus thrive in undiluted blood; this may indicate a possible relationship.

7. Whitehead, R., and Fairbrother, R. W.: B. Paratyphosum Infection with Intestinal Lesions Restricted to Colon: Report of Case, J. Path. & Bact. **35**: 974-975 (Nov.) 1932. Dawson, B., and Whittington, T. H.: Paratyphoid Fever, A Study of Fatal Cases, Quart. J. Med. **9**: 98 (Jan.) 1916.

8. Felsen, Joseph: Intestinal Oxygenation in Idiopathic Ulcerative Colitis, Arch. Int. Med. **48**: 786-792 (Nov.) 1931.

9. Paulson, Moses: The Effect in Vitro of Noncoagulable Human Blood on the Intestinal Bacteria of Man and Its Possible Relationship to the Etiology of the Dysenteries, Particularly That of Chronic Ulcerative Colitis, Tr. Am. Gastro-Enterol. A., 1933, to be published.

10. Brown, T. R.: Chronic Ulcerative Colitis, Ann. Clin. Med. **4**: 425-429 (Nov.) 1925.

11. Zweig, Walter: Repetitorium der Darmkrankheiten, Deutsche med. Wchnschr. **55**: 918-919 (May 31) 1929.

12. Thorlakson, P. H. T.: Ulcerative Colitis, Canad. M. A. J. **19**: 656-659 (Dec.) 1928; Tr. Am. Proct. A., 1929, pp. 100-120.

13. Douglas, S. R.; Colebrook, L., and Morgan, W. P.: Report upon Investigations in the United Kingdom of Dysentery Cases Received from the Eastern Mediterranean: IV. Report upon Combined Clinical and Bacteriological Studies of Dysentery Cases from the Mediterranean, Medical Research Committee, Special Report series 6, 1917, p. 75.

14. de Lavergne, V.; Melnotte, P., and Debenedette, R.: Sur la séro-agglutination dans la dysentérie à bacille de Flexner, Compt. rend. Soc. de biol. **103**: 1251-1252 (May 1) 1930.

continued presence of fresh blood in the intestine might explain, in a measure, the inability to isolate these organisms from many with chronic bacillary dysentery and in some other patients, who in consequence of this as well as of negative parasitologic and agglutination studies are classified as having chronic ulcerative colitis.

Ulcerative colitis and recurring or chronic bacillary dysentery are thought by many to be identical in these respects: The clinical course of the two conditions is indistinguishable. Pathologically, the appearances of the large intestine in bacillary dysentery and ulcerative colitis are not to be differentiated. Chronic bacillary dysentery, like chronic ulcerative colitis, usually involves the distal portions of the large bowel; in exceptional instances in both conditions the lesions appear to be restricted to the more proximal segments.[15] In acute bacillary dysentery, as in ulcerative colitis, the process attacks the mucosa with early rectal involvement.[15] In more than fifty cases of definite acute, subacute and chronic bacillary dysentery in infancy and childhood in which I have performed rectosigmoidoscopy, no normal rectums or sigmoids were seen. In most instances the appearances to me were identical with the appearance of ulcerative colitis. Other observers have reported similarly.[3] Roentgenograms in both conditions often are not unlike one another. Even many of the complications observed as occurring in ulcerative colitis, such as fibrosis, strictures, polypi, perforation, joint changes, and transient paralyses sometimes involving muscular atrophy, are noted by MacCallum [16] as complications of bacillary dysentery. Buie,[17] who wrote that the rectum and lower sigmoid were characteristic in chronic ulcerative colitis, now states, in speaking of the pathology of this condition, "I am willing to concede that this picture is variable enough to keep me somewhat in doubt as to its various manifestations."

Thorlakson [12] reports that Cadham, by a special technic, from the wards of the Winnipeg General Hospital, in nine isolated instances usually designated as ulcerative colitis, has found B. dysenteriae in one fulminating, two subacute and three chronic cases.

From the foregoing data, it appears that ulcerative colitis meets the requirements of a syndrome rather than of an entity. It is a set of symptoms and the sum of signs of a morbid state, the etiology of which is either unknown or, like bronchial asthma, variable. Its clinical course, with its pathologic manifestations, complications and sequelae, are indistinguishable from chronic bacillary dysentery, thus rendering its characteristics not specific for idiopathic ulcerative colitis.

The correlation of idiopathic ulcerative colitis and bacillary dysentery is not to be interpreted as my belief that the etiology of the latter is that of the former. The specific cause of ulcerative colitis remains undetermined and it is my impression that not the same etiologic factor is operative in every case, so that B. dysenteriae may have been the primary agents in some cases in which bacteriologic, serologic and parasitologic examinations are negative. The dissimilarities in these two conditions, however slight, do not seem explainable clinically in all cases of idiopathic ulcerative colitis on the basis of its being an aberrant form of bacillary dysentery.

15. Rogers, Leonard: Bowel Diseases in the Tropics, 1921, Oxford Medical Publications, London, Henry Trowde and Hodder & Stoughton, pp. 402-412.

16. MacCallum, W. G.: Dysentery Infections, in A Text Book of Pathology, ed. 5, Philadelphia, W. B. Saunders Company, 1932, pp. 590-594.

17. Buie, L. A.: Discussion on Ulcerative Colitis, Trans. Am. Proct. A., 1929, p. 112.

F. The Vitamin Theory: Avitaminosis as a cause of ulcerative colitis is not supported by clinical experience. However, experimentally, striking chronic lesions resembling this condition in man, macroscopically and microscopically, have been those produced in animals by the feeding of vitamin deficient diets. [18]

G. Focal Infection: Here, too, as in many conditions in which the cause is unknown, focal infection has been thought to be of etiologic importance. The relationship remains to be proved both experimentally and clinically. Experimentally, Cook's [19] researches appear inadequate because of the use of primary cultures which may or may not have been pure and the absence of control animal studies with streptococci and other organisms from foci of other types of hemorrhagic or ulcerative colitides. Still other studies [20] have been done with mixed cultures and cultures made from tooth and tonsillar foci, the determination of the sole presence of a specific streptococcus being made by morphology alone, a method regarded as unreliable, as will be indicated later. Clinically, there is no evidence of dissemination from a focus to a distant involvement, by a toxin, by positive blood cultures or by associated conditions, as arthritis in which the streptococci found are said to be different from the streptococci in ulcerative colitis.[1] Positive blood cultures are of no significance because of their rarity in spite of the ready access to the blood stream by intestinal organisms because of ulceration.

Obviously, eradication of all sources of infection should be undertaken. However, I have seen no instance in which striking amelioration could be attributed solely to such elimination. Relief thought to be so obtained often may be purely coincidental because of the self limited tendency of the acute phases or possibly of some influence of other associated forms of therapy.

H. Vagotonia: Its exact rôle remains to be determined. Eppinger and Hess [21] state that "these diarrheas rarely last longer than twenty-four hours." When they do, it is a suggestion that what was purely functional has become an inflammatory disease of the mucosa.

I. Calcium Metabolism: Disorders of calcium metabolism with possible tetanic manifestations and changes in capillary permeability, more marked in the intestine, have been said to be of some influence in this condition.[22]

J. Cocci: Diplococci, Pneumococci, Enterococci, Streptococci. A diplococcus may be a pneumococcus, an enterococcus or one of many varieties of streptococci. When observed as young cultures in liquid mediums, when smeared from solid mediums or from material secured directly from the bowel, these organisms—even those streptococci which in older liquid cultures or in subcultures may present characteristic chains—appear as diplococci. Occasionally diplobacilli, diphtheroids, staphylococci and small, plump gram-positive bacilli on direct smear, as well as from early

18. McCarrison, Robert: Studies in Deficiency Disease, London, Henry Trowde and Hodder & Stoughton, 1921; Faulty Food in Relation to Gastro-Intestinal Disorder, J. A. M. A. **78**: 1-8 (Jan. 7) 1922. Tilden, E. B., and Miller, E. G., Jr.: The Response of the Monkey to Withdrawal of Vitamin A from the Diet, J. Nutrition **3**: 121-140 (Sept.) 1930.

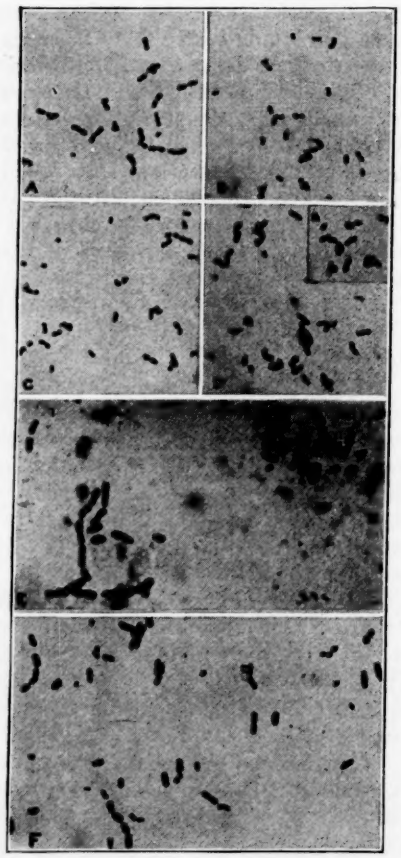
19. Cook, T. J.: Focal Infection of the Teeth and Elective Localization in the Experimental Production of Ulcerative Colitis, J. A. Dent. A. **18**: 2290-2301, 1931.

20. Bargen, J. A., and Logan, A. H.: The Etiology of Chronic Ulcerative Colitis: Experimental Studies with Suggestions for a More Rational Form of Treatment, Arch. Int. Med. **36**: 818-829 (Dec.) 1925.

21. Eppinger, Hans, and Hess, Leo: Vagotonia, ed. 2, New York, Nervous and Mental Disease Publishing Company, 1917.

22. Haskell, Benjamin, and Cantarow, Abraham: Calcium and Parathyroid Therapy in Chronic Ulcerative Colitis, Am. J. M. Sc. **181**: 180-195 (Feb.) 1931.

cultures in liquid mediums, especially when the cultures are mixed, may be indistinguishable from diplococci. Obviously, then, a diplococcus is not distinctive; morphology is not characteristic, it is merely descriptive. The use of terms such as "diplococcus" and "diplostreptococcus" to designate a specific organism is therefore an error, for they denote characteristics common to several types of intestinal streptococci. The attempt, then, to diagnose the presence of any one or more of these organisms on the basis of morphology alone—in smear and culture of intestinal material or in intestinal tissue—is plainly a futile task, as shown in the accompanying illustration. Yet there is published evidence of such occurrences, as will be noted, on which definite deductions have been based with respect to the etiology of ulcerative colitis.



Examples of nondistinctiveness of the diplococcal arrangement of a variety of strains from ulcerative colitis in Rosenow's dextrose brain broth: *A*, alpha zoned streptococcus; *B*, alpha zoned enterococcus; *C*, beta hemolytic streptococcus; *D*, gamma zoned (nonhemolytic) streptococcus; *E*, Welch bacilli; *F*, mixed culture of all the foregoing strains.

For instance, pneumococci have been said to be etiologically responsible for ulcerative colitis, apparently because diplococcal forms present in feces resembled them morphologically. There is no instance or record in which the reported presence of this organism has been substantiated by adequate identification. Also, Bargen, working under Rosenow and with Rosenow's methods, in presenting, in 1924 and 1925, experimental data on which his entire hypothesis is founded, namely, that a gram-positive diplococcus is the cause of ulcerative colitis, reported seventy-five strains as isolated with only twenty-five studied culturally. In 1927 the organism was reported [23] as isolated in 189 of 266 cases, 105 of which were determined culturally. Here, eighty-four strains seem to have been established purely on the basis of morphology. This method of diagnosis is regarded by many bacteriologists as inaccurate, misleading and untenable for reasons just noted.

In 1924 and 1925, the so-called diplococcus was reported by Bargen [20] as that of an alpha zoned (J. H. Brown classification) bacterium, which "never ferments inulin or mannite." [24] In 1927, Bargen [23] added that of "105 strains tested, 41 fermented mannite and 64 did not." In 1930 he [25] reported that the diplococcus "does not usually ferment mannite but lacks the power to ferment inulin."

The first requirement in the establishing of a particular organism as being "etiologically significant" in ulcerative colitis or in any other disease is that the criteria for its identification as set down by its proponent be constant, at least in his own hands. Obviously, this has not been the case. That cocci morphologically identical but culturally different—more than one type of coccus—have been dealt with, a contention that I [26] have maintained for years, is evidenced by these changes in characteristics originally given as constant and as differentiating them from similar organisms. On the other hand, there is no proof that these alterations, encountered presumably under identical conditions, are variations of the same bacterium.

Organisms presenting these characteristics have been isolated by me from normal human feces by a technic described elsewhere, from ulcerative colitis and in rarely encountered acute and subacute amebic dysentery cases. The presence of such bacteria in chronic bacillary dysentery is now being investigated.

Thus, intestinal lesions produced in animals by the intravenous injection of more than one type of streptococcus, as well as similar but more marked lesions secured on the administration of mixed cultures,[27] obviously cannot be accepted as experimental proof of the specificity or of the significance of a definite organism in the etiology of this condition. Incidentally, etiologic specificity itself has been urged by attempted descriptions of a particular organism, the desire to establish the condition as an entity, and especially by the use of such terms as "definite causative microorganism," "specific vaccine" and "specific serum."

Inadequate control studies, as has been pointed out in detail elsewhere,[28] in addition to the absence of essential control data, as the isolation and the response of laboratory animals on administration of streptococci and other organisms from other types of ulcerating or hemorrhagic colitides, is a further bar to the acceptance of such contentions. Suffice it to say that a perusal of the literature does not indicate a single study, adequately controlled, confirming a specific organism as the cause of this condition, nor am I able to determine from such sources which streptococcus can be regarded as of etiologic or secondary significance, since the criteria have varied from time to time, indicating a variety of streptococci involved.

In thirteen of fourteen cases of acute exacerbations of chronic ulcerative colitis, I [27] isolated ten types of streptococci, including the "diplococcus" meeting Bargen's original criteria. No one type was found to be present in more than three cases, the so-called diplococcus being isolated in two cases, in one of which it predominated. Five of seven varieties of alpha zoned streptococci intravenously injected into rabbits, including the organism originally referred to by Bargen, produced lesions, confirmed by microscopic sections, primarily in the lower colons and rectums of 45.5 per cent of the animals. A rectal and a colonic involve-

23. Bargen, J. A.: Chronic Ulcerative Colitis: Bacteriologic Studies and Specific Therapy, Tr. Am. Proct. A., 1927, pp. 93-99.

24. Bargen, J. A.: The Treatment of Chronic Ulcerative Colitis Based on the Demonstration of a Definite Causative Micro-Organism, J. Iowa M. Soc. **16**: 218-221 (May) 1926.

25. Bargen, J. A.: Chronic Ulcerative Colitis, Arch. Int. Med. **45**: 559-572 (April) 1930.

26. Paulson, Moses: Chronic Ulcerative Colitis with Reference to a Bacterial Etiology: A Survey, in Nelson's Loose-Leaf Living Medicine, May, 1929, pp. 349-360; Nelson's Loose-Leaf Living Surgery, April, 1929, pp. 149-160. Brown, T. R., and Paulson, Moses: Chronic Ulcerative Colitis, Internat. S. Digest **8**: 67-85 (Aug.) 1929.

27. Bargen;[23] Experimental Studies on the Etiology of Chronic Ulcerative Colitis, J. A. M. A. **83**: 332-336 (Aug. 2) 1924. Paulson, Moses: Chronic Ulcerative Colitis with Reference to a Bacterial Etiology: Experimental Studies, Arch. Int. Med. **41**: 75-96 (Jan.) 1928.

28. Paulson.[26] Brown and Paulson.[26] Paulson.[27]

ment was noted in one of six rabbits intravenously injected with the so-called diplococcus. A heated (killed) culture of a beta hemolytic streptococcus (foreign protein) isolated from the uterus of one with puerperal sepsis, B. coli from a normal human sigmoid and in a case of amebic dysentery, and B. dysenteriae Shiga and Flexner produced lesions, confirmed by microscopic section, similar in pathology and location to those just referred to in a large number of rabbits. In short, this research shows the variety of streptococci to be found in cases of ulcerative colitis and the production of lesions identical in pathologic changes and similar in location produced by several of them as well as by organisms from other sources. A subsequent study,[29] tending further to establish this nonspecificity of bacterial influences in the etiology of ulcerative colitis, showed another strain of streptococcus not previously encountered as producing lesions—proved by microscopic section — in the intestine of four of six animals. In addition, B. lactis-aerogenes and B. coli and foreign protein (sterile dextrose brain broth) produced diarrhea in some instances. Later, Buttiaux and Sevin[30] demonstrated that still another streptococcus isolated from ulcerative colitis produced colonic lesions in rabbits, which roentgenologically were similar to those sometimes seen in man with ulcerative colitis.

At this time it appears that, of possible bacterial factors in the etiology of ulcerative colitis, streptococci and enterococci, normal inhabitants of the intestine, are the most significant as secondary phenomena, not by reason of animal experimentation, which, as noted, remains inconclusive, but because of the following:

1. Recent studies[9] have shown that when fecal emulsions are grown in vitro in human noncoagulable blood in normal and ulcerative colitis cases, by a simple technic intended to stimulate continued bleeding, only streptococci and enterococci survive. In infusion bouillon controls, gram-negative bacilli predominate. Under identical conditions in diluted blood (1 cc. of blood to 3 cc. of saline solution) other organisms lived but not as numerously as in bouillon, resulting in a quantitative diminution of flora and a relative increase, when not absolute, of cocci because of the greater ability of the latter bacteria to live in blood than of the other intestinal bacteria, which are destroyed or inhibited by the bacteriocidal and bacteriostatic properties of this tissue.

From this research, the following deductions have been made: This diminution of flora noted in ulcerative colitis and in the few severe amebic dysentery cases seen in Baltimore, as well as the relative increase of cocci in many cases of the former (the bacteriology of amebic dysentery has not been studied in this connection), is due, in part if not completely, to the presence of blood which appears to act, generally speaking, less deleteriously on cocci than on other organisms of the intestinal flora. Thus, the greater and more prolonged the intestinal bleeding, regardless of cause, the more marked changes of the nature described appear likely to occur. The presence of blood, then, favoring the growth of cocci normally present, may result in their becoming pathogenic and continuing the process,[31] especially since Todd[32] has demonstrated that the passage of streptococci through serum alone in many instances will reestablish virulence. It is thought also—in view of this research—that other organisms, normally present in the intestine, surviving in this abnormal medium, may assist to a lesser degree in carrying on the involvement. If the production of colonic lesions in animals by intestinal bacteria is of import, then further support for this belief is to be had in the fact that more profound lesions are to be encountered with mixed than with pure cultures.[27]

2. Streptococci indistinguishable culturally from those described as being found in ulcerative colitis have been isolated from normal stools by Dukes[33] and by myself[9] by the use of blood as a medium, the details of which are described elsewhere, in which streptococci multiply and other organisms are destroyed or inhibited. Pathogenicity, then, ascribed to such bacteria or any other organisms normally present, presupposes a preceding or primary factor responsible in some measure for this altered characteristic. Such normal presence precludes considering them in the same light as Endamoeba histolytica and the typhoid-paratyphoid-dysentery group not normally encountered, and primary causative agents of dysentery.

3. Streptococci in ulcerative colitis, in my experience, usually are not in actual predominance but may be relatively increased. If they were primary agents, an absolute increase on direct blood agar plates would be expected. Intricate cultivation methods and the difficulties in isolation, even with the use of a selective medium for streptococci, as Rosenow's dextrose brain broth, further indicate this lack of preponderance. Such predominance alone in Rosenow's dextrose brain broth is of no significance because it is a selective medium.

4. Logan's effort showing that "sterilizing the colon has not resulted in healing the ulceration" indicates the presence of other factors in the etiology of this condition.

PROGNOSIS

It has been the experience of the gastro-intestinal group at the Johns Hopkins Hospital that, if sufficient time is allowed, recurrences are virtually certain to occur in all but the exceptional cases. The possibility of permanent cure is remote in any type of true ulcerative colitis at the present writing. The acute fulminating severe cases present a high mortality regardless of the method of treatment. However, it is surprising how long some patients can live even when local and general symptoms are marked.

TREATMENT

Idiopathic ulcerative colitis primarily is a medical problem; every case first should have the benefit of thorough medical treatment. While most of the milder cases, in my hands, are well controlled by dietetic and pharmacotherapeutic measures, usually without polyvalent vaccine or serum, the management of the severer ones is discouraging, in that apparent relief, regardless of the concomitant therapeutic agents used, is followed by relapse, if they are observed long enough.

Unfortunately there is no "specific" therapy in this disorder. Therapy, in this condition, to be regarded as specific — in the light of prevailing knowledge —

29. Paulson, Moses: Data to be published; presented in abstract on "Colitis" symposium, American Gastro-Enterological Association, Atlantic City, N. J., May 5, 1930.

30. Buttiaux, R., and Sevin, A.: Sur l'étiologie des colitis ulcéreuses, Ann. Inst. Pasteur **47**: 173-216 (Aug.) 1931.

31. Paulson, Moses: The Bacterial Flora and Hydrogen Ion Concentration of the Human Ileum: The Effect of Acidophilus Milk and Lactose and the Possible Relationship of Ileal Flora to Colitis, Bull. Johns Hopkins Hosp. **45**: 315-330 (Nov.) 1929; Tr. Am. Gastro-Enterol. A., 1928, p. 235.

32. Todd, E. W.: Observations on Virulence of Hemolytic Streptococci, Brit. J. Exper. Path. **8**: 289-302 (Aug.) 1927.

33. Dukes, C.: Discussion on Colitis, Proc. Roy. Soc. Med. (Sect. Surg.) **24**: 794-795, 1931.

should meet the following criteria: First, the product should be prepared from the causative organism; this, as has been indicated at length, remains to be determined. Second, the response on its administration should be abrupt, marked, complete, without remissions or intermissions and recurrences; the facts are that the response, not unlike that to foreign protein therapy, is, when it occurs, relatively slow, and that permanent cessation, save possibly in an isolated instance, remains to be established. Third, the attainment of a "cure" should be susceptible of accomplishment only with the "specific" therapeutic agent and none other; yet other measures have been used simultaneously with such "specific" agents, while transfusions alone, as well as preparations other than those said to be specific, have accomplished, frequently, similar results.

Numerous observers have reported "good results" on the use of mixed autogenous vaccines and of those either of enterococci, dysentery or colon bacilli.[26] Bargen,[34] who in 1927, on "specific" vaccine administration, reported markedly satisfactory responses in 153 of 200 cases (77.5 per cent), the majority of which presented severe manifestations of ulcerative colitis, stated in 1929 that specific serum, so called, was being used, since results with "specific vaccine" in severe cases were unsatisfactory.[35] Of seven patients receiving adequate amounts of this serum, two died and two were clinically well. Later,[36] twenty-four of fifty patients were reported as symptom free. However, rectosigmoidoscopy often reveals little objective improvement in many who appear well. In view of these facts, as well as of the knowledge of the self limitation of exacerbations and of the recurring characteristics of this condition, it will be necessary to wait at least five years before his later reported benefits with serum can be properly evaluated objectively as well as subjectively. Remissions have been known to occur on mere bed rest alone. Recently Kalk[37] reported startling relief on both the intramuscular and the intravenous injections of ordinary horse serum in some ulcerative colitis cases. Hurst, Crohn, Bell, Boehnke, and Korbsch and Gross (the last named state that they have reports of nine others showing similar experiences) have in recent years reported striking remissions or intermissions by the intravenous injection of polyvalent antidysenteric serums.[26] However, this has not been the experience of Tidy and Watson.[38] T. R. Brown and I have felt on occasion that in some cases there was more than a coincidental relationship between the administration of polyvalent antipneumococcus serum and the relief secured. Incidentally, it is believed that the serum made by Mulford-Sharp and Dohme for use in ulcerative colitis cases is a polyvalent streptococcus serum, since in our hands the organisms sent by Bargen and used by them in its preparation represent more than one distinct strain of streptococci.

Of late, transfusions alone[39] have been used with marked success in many cases, but already there have been some recurrences. The marked improvement said to be noted roentgenologically on the administration of "specific" serum and vaccine has been reported when blood transfusions alone[40] or horse serum is used.[37] Bacteriophage has been used in isolated cases[41] and calcium and paratyphoid therapy have been reported as beneficial.[22]

In short, the medical management consists of rest, psychotherapy, diet, drugs, vaccines, serums, irrigations and instillations (although irrigations and instillations are not recommended), all of which have been detailed in the articles to which references have been made here. In ulcerative colitis it is felt that any procedures offering the slightest possibility of relief may be justifiably used.

As for surgery, it is believed that ileostomy should be the operation of choice because it puts the colon to rest, and that it should take place somewhat earlier than is practiced, "before ulcerations have become too deep, the disease very extensive, general resistance lowered and metastatic involvement of other organs and tissues have brought about irreparable damage."[10]

SUMMARY

1. Chronic ulcerative colitis is a syndrome, for it presents a fairly constant set of symptoms and signs, possibly of variable but of no demonstrable specific etiology. It involves the large intestine, particularly its distal segments, and resembles chronic bacillary dysentery clinically, pathologically, roentgenologically, and in some respects bacteriologically and serologically. However, the exact relationship between B. dysenteriae and this condition must remain *sub judice*.

2. (*a*) Avitaminosis as a cause of ulcerative colitis is not supported by clinical experience, although the experimental evidence is striking.

(*b*) Vagotonia, as well as disturbances of calcium metabolism, has been thought to play a rôle in etiology.

(*c*) There is neither satisfactory direct evidence nor properly controlled confirmatory studies establishing a specific or primary etiologic association between any bacterium and chronic ulcerative colitis.

(*d*) The definite connection between foci of infection and the etiology of this condition remains to be proved both experimentally and clinically.

(*e*) Experimental data indicate the nonspecificity of bacterial influences in this disorder.

(*f*) Recent work suggests that the greater and more prolonged the bleeding, regardless of cause, the greater will be the diminution of the flora and the more marked the relative increase in cocci. These cocci, and to a lesser extent the other surviving intestinal organisms, normally present, probably are responsible for a secondary infection.

3. Recurrences at present are certain to occur in all but the exceptional cases. The possibility of permanent cure is remote.

4. There is no specific therapy, since the specific etiologic factor, if there is any, remains to be determined and the therapeutic response is not specific. Ileostomy is regarded as the operation of choice and should take place earlier than is practiced usually.

Medical Arts Building.

34. Bargen, J. A.: The Medical Management of Chronic Ulcerative Colitis: A Statistical Study of Two Hundred Cases, Tr. Am. Gastro-Enterol. A. (1927) **30:** 145-159, 1928.

35. Bargen, J. A.: Specific Serum Treatment in Chronic Ulcerative Colitis, Arch. Int. Med. **43:** 50-60 (Jan.) 1929.

36. Bargen, J. A.; Rosenow, E. C., and Fasting, G. F. C.: Serum Treatment for Chronic Ulcerative Colitis, Arch. Int. Med. **46:** 1039-1047 (Dec.) 1930.

37. Kalk, H.: Therapie der Colitis gravis durch Erzeugung von Anaphylaxie und mit Bluttransfusionen, Ztschr. f. klin. Med. **118:** 560-583, 1931.

38. Tidy, H. L., and Gorden-Watson, C.: Discussion on Ulcerative Colitis, Proc. Roy. Soc. Med. (Sect. Surg.) **24:** 797-800, 1931.

39. Rachwalsky, E.: Weitere Erfahrungen mit Bluttransfusionen bei Colitis Ulcerosa gravis, Deutsche med. Wchnschr. **56:** 1952-1953 (Nov. 14) 1930; Meinungsaustauch über die Behandlung der Colitis ulcerosa (gravis) mittels Bluttransfusionen, Arch. f. Verdauungskr. **50,** November, 1931, No. 5-6.

40. Hensle, Walter: Zur Behandlung der Colitis ulcerosa mit Bluttransfusion, Med. Klin. **28:** 1461-1462 (Oct. 14) 1932.

41. Nelson, E. M.: The Treatment of Ulcerative Colitis by Means of a Bacteriophage, Journal-Lancet **51:** 45-46 (Jan. 15) 1931, Appletons, W. E.; Myer, S. P., and Love, J.: A Case of Severe Ulcerative Colitis Treated with Bacteriophage, Kentucky M. J. **29:** 372-375, 1932.

ABSTRACT OF DISCUSSION

DR. SARA M. JORDAN, Boston: There are two aspects of ulcerative colitis which are worthy of further elaboration. First, it has an acute phase which suggests an acute infectious process for which I hope there is a definite, specific agent which can be treated and for which help may be hoped for from vaccines. Second, it has the phase of chronicity and of periodic remissions, which make me feel in sympathy with the suggestion offered by Dr. Thomas Brown at the last meeting of the Gastro-Enterological Association, in Washington, when he asked the question: Is it not possible that there is no definite, specific organism responsible for this disease but that it is due to the absence of some defense mechanism or some defense organism which prevents the infection of the intestine by the normal inhabitants of the intestine? These two aspects of the disease make both of these theories a possibility. One of my associates, Dr. Kiefer, made a study of thirty or forty cases in which he has tested the blood of patients with ulcerative colitis and found in 74 per cent that the Craig test for Endamoeba histolytica was positive, and in many of these cases antiamebic treatment gave what was thought to be favorable results. In the treatment of this disease, therefore, the possibility is considered of an association of Endamoeba histolytica, and secondary ulcerative colitis, and I feel that it is sometimes well to use antiamebic treatment in ulcerative colitis. Dr. Paulson mentioned that ileostomy must be done early enough. One must not operate too early. It is a very serious problem to decide when an ileostomy should be done. One must take into consideration not only the fact that ileostomy is an unpleasant condition but that it is a permanent condition. In my experience an ileostomy cannot be taken down. The colon does not regenerate. The acute septic symptoms are undoubtedly relieved and a patient who otherwise might die lives, but his colon does not heal. Therefore one has to be guided by good clinical judgment and perhaps also by a bit of good fortune in deciding which cases should have ileostomy and which should not.

DR. FRANK SMITHIES, Chicago: During the past decade, attention has been called to four major types of colitis associated with ulcerative lesions: (1) the prevalence of amebic lesions; (2) the presence of chronic ulcerative colitis, "idiopathic or regional ulcerative colitis" (by Bargen); (3) tuberculous ulcerative colitis, and (4) the type of colitis emphasized by Crohn, in which one deals with definite infective processes localized at the terminal ileum and cecum. I have maintained that in "Bargen's syndrome" one is dealing with a fairly localized infectious ulcerative disease of the colon, which infection is secondary to an infectious ailment somewhere else, after the fashion, perhaps, of widespread metastases occurring in malignant disease. I consider that chronic ulcerative colitis of Bargen's type is a local evidence of a systemic infection carried from somewhere else, by lymph and by the venous blood streams. Study of early cases gives clues to the process of ulcer production: these early lesions exist as infectious thrombi of minute blood capillaries; in the secondary stage these coalesce as early, primary, multiple petechial lesions, and, in the third stage, systemic-borne infection of these areas occurs and ulcer production follows. It is the study of only well established instances of this localized, infectious ulcerative colitis that accounts for the failure to appreciate the causative mechanism and to neglect consideration of the underlying vascular anomalies that readily facilitate local stagnation and the persistent presence of bacteria conveyed to the region from far distant foci. Such distant foci are about the head, the teeth, the endocardium, the biliary tract, and probably the wall of the bowel itself (either primarily from stagnant bowel contents or blood and lymph borne). Therefore, in addition to local treatment of the bowel lesions the proper therapy consists in the location and eradication of primary foci of infection, measures to combat the systemic damage caused by that infection, and general supporting treatment. In my experience, transfusions of whole blood, freely given, have proved of greater value than "specific vaccines" or their derivatives.

DR. FRANK H. LAHEY, Boston: I am prompted to say a few words about the surgical treatment of this lesion because it is a serious lesion and because often the question of life hangs on a narrow balance. There are a certain few things that my associates and I have learned in approximately forty of these cases which are of value. One is that ileostomy must be of the transverse type rather than of a lateral type in order that the course of the fecal stream may be completely sidetracked. Next, the decision must be made, if one is in doubt, on the early side. We have definitely lost patients by delay. Finally, one must realize when these patients are operated on that this colon must be handled like a hot coal, because its walls harbor organisms. The vessels close to the mesentery are lined and filled with septic thrombi, which readily become septic emboli. Manipulation produces distant infection and local peritonitis; therefore, surgeons should realize that these patients should be operated on under local or spinal anesthesia. The ileum should be hooked up, pulled out, implanted and cut across; and the less done, the better. In a majority of these cases, ileostomy does not cure ulcerative colitis. When they reach the stage in which an ileostomy is needed, multiple destructive lesions in the colon have left strictures, fibroses and narrowing, and in many of the cases even after a temporary relief from ileostomy there has been a discharge of blood and pus that we have succeeded in curing ultimately only by colectomy. When these patients have a return of symptoms after an ileostomy, they can be relieved of these symptoms by complete colectomy in stages.

DR. M. H. STREICHER, Chicago: The one point I agree on with Dr. Paulson is that there is no specificity in any organism. I agree with Dr. Buie and Dr. Bargen that there are definitely four stages which one can differentiate. If one sees enough material one will differentiate the various stages without difficulty. Since 1926 I have observed 220 cases. The diplostreptococcus of Bargen is not specific but is of primary importance. I have had vaccines made of several types and in the cases in which the Bargen diplostreptococcus was left out the patients did not get along as well. That is the best criterion that I have. The vaccine that I have made up is a mixed polyvalent bacterial vaccine. This is the best that can be done at the present time. This vaccine includes the Bargen diplostreptococcus in addition to other bacteria. I want to refer to what Dr. Lahey and Dr. Jordan said about surgery. In all the operative cases that I have seen, including the three colostomies that I have done, I have nothing but criticism to offer. Surgery in ulcerative colitis is cruelty.

DR. JOHN L. JELKS, Memphis, Tenn.: This is interesting to a man who looks into one or more colons every day. He hasn't found any of these diplococci of Bargen. He has seen a good many cases so diagnosed. He has treated cases that had been treated for the Bargen bacillus for a year; the colons were badly ulcerated and filled with Amoeba histolytica. He has seen cases treated thus that presented suppurative tonsils, sinuses filled with pus, and pyorrhea. In the chapter on protozoa in man in Sajous's Cyclopedia of Practice of Medicine, I am referring to the fact that I am finding some important factors in productivity in these cases. I am referring to Spirillae and recommending that oral sepsis and accessory sinuses should never be omitted, whether the case is amebic or not amebic. There are many streptococcic colitis cases, which have not been so diagnosed but were called chronic ulcerative colitis, spastic colitis, spastic diarrhea, or mucous diarrhea. In the treatment of these cases it has been well said that one should be careful not to operate too soon as well as to do it soon enough. I prefer the transduodenal irrigation in these cases, with a proper diet and proper colonic irrigations.

DR. L. A. BUIE, Rochester, Minn.: Some of the statements that have been made here have been erroneous and I feel that it is necessary for me to defend one of the most valuable forms of treatment in the care of patients with ulcerative colitis, be it specific, chronic, amebic, bacillary, or what not. My experience has been that the treatment with serum prepared from the Bargen organism has been curing patients. The records of those patients are far better than the records of patients treated years ago by the medical management, referred to by those who are still in doubt. When patients are in desperate condition with a destructive disease, cannot former experience with an inferior method be accepted as a control to determine that a later method is superior, even if such a procedure might not be accepted in a laboratory as a controlled experiment? In this day of enlightenment, are we to take patient A and treat him

with a curative serum, and patient B and treat him with something that we know is not going to cure him, in order to satisfy the requirement of some skeptics for control experiments? Is that being done in the practice of medicine today? I am glad that it is not necessary to rely on the bacteriologist for a diagnosis of chronic ulcerative colitis. I am profondly grateful for the good old fashioned doctor who can call ulcerative colitis a disease instead of a syndrome.

DR. MOSES PAULSON, Baltimore: Every statement that I have made here today is based on clinical experience and research as well as on the work of others to which references have been made in the paper. Etiology and therapy should not be confounded clinically. In most disorders they present separate clinical problems. For instance, in duodenal ulcer little or nothing is known of its cause, yet management in the majority of cases by any one of several means is regarded as rather satisfactory. The converse also is true: the cause of a condition may be generally agreed on, yet treatment may be of no avail, as in bacterial endocarditis. In ulcerative colitis no deductions with respect to a specific etiology can be drawn on the basis of reported promising responses by therapeutic agents said to contain a specific etiologic factor, for the reasons already outlined in this paper, particularly under the heading of therapy. As far as the reported successful treatment of ulcerative colitis at Rochester is concerned, it is my impression that it is due more to what is known as the successful application of the art of medicine rather than to any particular therapeutic procedure.

ORIGINAL FEATURES OF ARTHROPLASTY OF THE HIP AND KNEE

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With regard to the wisdom of mobilizing ankylosed hips, one finds considerable difference of opinion among the best of surgeons. Henderson, reviewing the end-results of arthroplasties of the jaw, elbow, knee and hip, found those for the hip the poorest. Murphy, on the other hand, found that the hip gave him the best results. The problem is obviously more complicated in weight-bearing joints. The occupation and social status of the patient, as well as his temperament, are often determining factors in deciding whether or not to operate. When the hip and knee on the same side are both ankylosed, the advantages of arthroplasty are much increased.

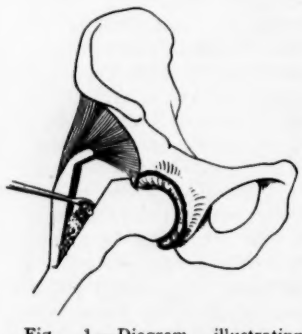

Fig. 1.—Diagram illustrating erection of bone-muscle lever at the hip to prevent dislocation and restore power of abduction and weight bearing.

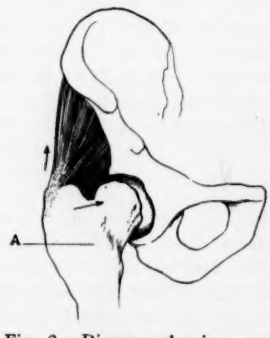

Fig. 2.—Diagram showing result after healing with adequate trochanter leverage.

It must always be remembered that stability is very important in the hip, and, although the rotary nature of the joint lends itself to arthroplasty, unfortunate results have followed arthroplasty when stability was not obtained.

Arthroplasty in cases of tuberculosis should be approached with a great deal of conservatism and only when the roentgenogram shows evidence of complete disappearance of all disease and a complete homogeneity of bone structure throughout the operative field.

Murphy in 1904 reported his technic for arthroplasty of the hip and in 1906 Hoffa [1] reported five arthroplasties of the hip (three by Rochet and two by Nélaton [2]). From that time on, an increasing number are found in the literature. In fact, in my practice, arthroplasty has become so dependable and well regarded that whenever doing an operation to arthrodese a joint, if that case is a possible favorable case for future arthroplasty, I so plan my arthrodesing operation as to make it possible for the future operation to mobilize. At the hip, tibial grafts are preferable because of their possible adequacy of length and strength, thus making it unnecessary to incorporate them in the joint itself. Too, I prefer to take bone elsewhere rather than to disturb unduly periarticular structures or surrounding muscles by obtaining the bone graft material locally. At the knee, for the same reason, I no longer employ the patella as a source of arthrodesing material. After its diseased portion has been removed, the patella is left as intact as possible.

Fig. 3.—Postoperative result of arthroplasty of hip previously arthrodesed for tuberculosis by two tibial grafts, stumps of which can be seen, purposely left long to increase power of abduction and weight bearing.

To be classed as a good result in the arthroplasty of the hip, there should be a minimum amount of voluntary flexion of at least 25 degrees. Everything being considered, a hip that possesses 25 degrees of painless active motion is far superior to a stiff hip. The joint must be painless and stable in weight bearing. Not only should the hip joint have motion to allow proper sitting but it should function in locomotion as well as in bearing the weight of the body. It is far better to have a stiff immobile hip than a usable one accompanied by weakness, and Baer goes on to say that "the more nearly the joint is similar in size and shape to the original joint the greater will be the stability. Hence arthroplasty is not a resection!" This statement may be true, but one frequently sees excellent functioning

Read before the Section on Orthopedic Surgery at the Eighty-Fourth Annual Session of the American Medical Association, Milwaukee, June 14, 1933.

1. Hoffa: Ztschr. f. orthop. Chir. **17**: 1, 1906.
2. Nélaton: Bull. et mém. Soc. de chir. de Paris **28**: 687, 1902.

hip joints when there has been an extensive destruction of bone and no semblance of a ball and socket joint remaining. The reason for this is that the muscle control is the all important consideration as to whether a hip is stable and whether there is a satisfactory amount of active motion and weight bearing.

To resolve the mechanics of the hip into simple terms, the hip joint itself is a fulcrum point situated at the end of a lever; namely, the neck of the femur, the distal end of which, or the great trochanter, is controlled by means of powerful muscles that are able, because of this mechanical setup, to pull the thigh into abduction, which is a most important feature of locomotion in that it has very materially to do with proper weight bearing. It is impossible for an individual to bear weight on a limb when the hip is mobile unless the muscle control is such that the limb can be held so that it will not swing into adduction. This is brought about by the mechanical action of the abductor muscles of the hip pulling on the distal end of the lever; namely, the neck of the femur.

If this statement, used as a premise, is true and if it is possible to maintain this muscular control, then the careful modeling with the head of the femur fully filling a deep new-made acetabulum with the difficulty of securing a free range of motion incidental thereto is not necessary or desirable. The deeper the new acetabulum is made with the corresponding femoral head, the greater the task of securing a good range of motion. Therefore, in selecting cases for arthroplasties of the hip, one should be sure that the muscles about the hip are reasonably preserved. Formerly it was my practice to rule out cases in which there had been extensive shortening of the neck of the femur, either from bone destruction or from a telescoping of the head and neck of the femur into the pelvis, for the

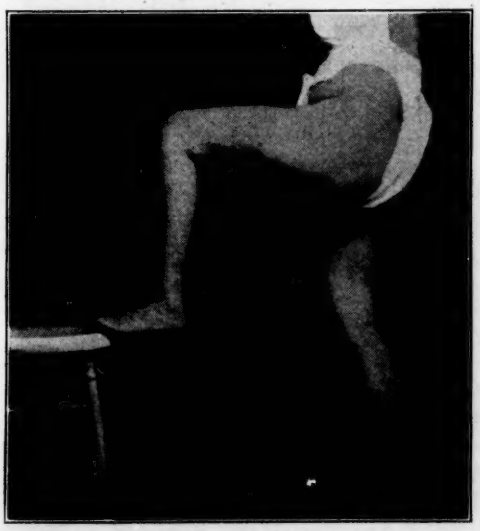

Fig. 4.—Range of flexion obtained in case shown in figure 3.

reason that even if the abductor muscles were intact one could never expect satisfactory function of active abduction because the femoral neck lever would still be further shortened by the modeling of the new-formed hip at operation. This was fully realized in designing my reconstruction arthroplasty for ununited fractures of the hip with removal of the head of the femur, and because of this the leverage action of the neck of the femur that was lost was restored by lengthening the lever on the outer side of the long axis of the shaft of the femur by erecting, laterally and obliquely to the shaft, a bone muscle lever with the insertion of the hip abductors to its upper end undisturbed.

In this way one is able, even in the complete absence of the head and neck of the femur, with the denuded trochanter placed in the acetabulum, to establish a lever

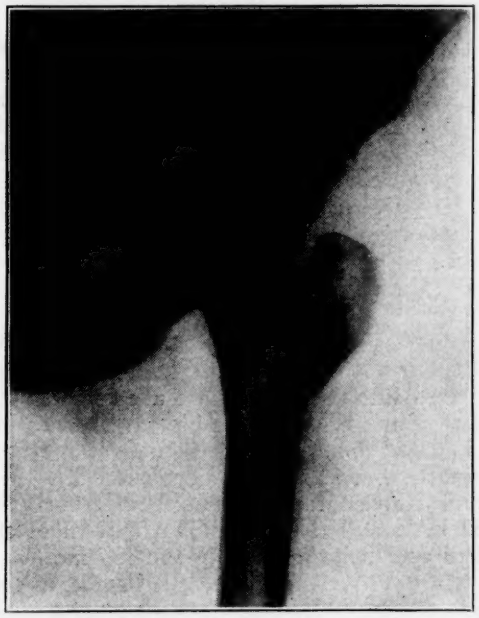

Fig. 5.—Result of erecting bone muscle lever.

equally long and nearly as efficient as the normal neck of the femur, with the normal hip joint intact. Mechanical conditions brought about in this manner not only restore abduction with the weight-bearing function of the hip but also prevent dislocation, because as the limb approximates the midline the danger of dislocation where the acetabulum is shallow increases. It should also be realized that it is true that as the limb seeks the midline the erected bone graft lever, already described, travels farther and farther away from the rim of the acetabulum and the side of the pelvis and thus not only puts an increasing tension on the short abductor muscles but also on the surrounding fascial structures, thus holding the head of the femur in the acetabulum and preventing dislocation.

In recent years the destruction of the head and neck of the femur (with telescoping) has not been a deterrent influence to me in selecting such a case for arthroplasty, in that I have found in doing an arthroplasty that a hip joint could be modeled with the head of the femur much smaller than the acetabulum, with sufficient fascia and fat to fill in the interspaces, and that the mechanical influences brought about by the provision of leverage action for muscle control on the outer side of the trochanter not only prevented dislocation but allowed active abduction and satisfactory weight bearing.

TECHNIC

The patient should be placed on a fracture orthopedic table. The Sprengel-Smith-Petersen incision affords such satisfactory exposure that it is the incision of choice for all intra-articular operations, including arthroplasties of the hip. The incision begins at a point about 4 inches below the anterior-superior iliac

spine and is carried along the outer border of the sartorius muscle, upward to the anterior spine and thence backward, following the iliac crest. The gluteal muscles are detached and reflected subperiosteally from the wing of the ilium downward *en masse,* thus giving a wide exposure of the hip joint.

By means of a large carver's or Murphy's gouge, the femur is separated from the pelvis, care being taken to make the bone incision in such a way that a rounded femoral head and a corresponding acetabular cavity are shaped. The acetabulum is not shaped nearly as deep as it formerly was because of the fact that I find that my technic obviates the danger of dislocation, and I further find that this is a very satisfactory influence in bringing about a greater degree of ultimate motion. I have found the various carver's gouges and chisels of great service in my plastic bone work, especially in arthroplasties. The large variety of cutting edges and curvatures of the chisel or gouge shafts enables the surgeon to select the proper tool for almost any emergency.

After the general contours of the joint are thus blocked out, the surfaces are merely smoothed and transformed into regular convex and concave surfaces by means of my arthroplastic hip rasps. The smoothness of these joint surfaces is most important, and therefore the work should be done carefully. The concave and convex rasps are placed in between the femoral head and the acetabulum and these surfaces smoothed and shaped by a to-and-fro motion of the handle, in the manner of a spoke of a wheel. The tools will execute this work faster if an assistant pushes upward on the patient's knee. These instruments enable the surgeon to shape accurately the inner portion of the joint which cannot be seen or gotten at by any ordinary instrument.

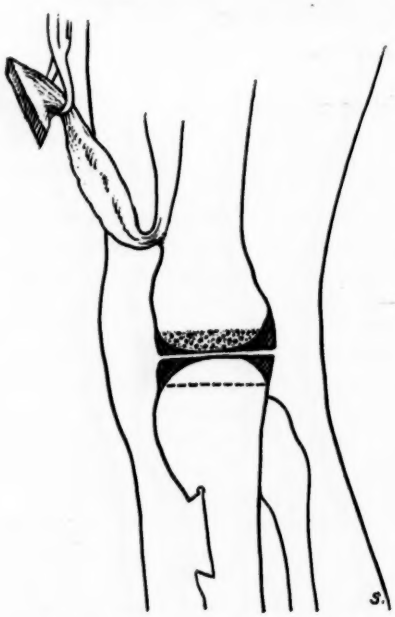

Fig. 6.—Diagram showing author's approach, by turning upward patella and attached tendons with tubercle of tibia. The patella and tendons are restored by sliding dovetailed block of bone into place from side.

The next step is to apply traction to the limb, to separate the head from the acetabulum, so that the bone particles can be washed out by means of a glass cannula connected with a fountain of saline solution over the table, and to allow the easy insertion of the fascial flap, about to be obtained from the thigh, lower down. A semicircular skin incision is made on the outer side of the thigh, midway between the wound and the knee, and a quadrilateral piece of fascia lata with as much fat as is obtainable and about 4 inches long by 3½ wide (in adults) is secured. The subcutaneous layer of fat is divided in equal halves—one half being left attached to the skin and the other half to the graft, which is subsequently to be removed. With a small curved needle, stay sutures are placed in what are to be the two inner corners, and the fascial graft is drawn in and pushed into the inner confines of the new joint by some instrument as far as possible between the new joint surfaces. Additional sutures are then placed about the periphery of the graft. The fascia is carefully approximated by a continuous suture of number 1 chromic catgut.

If at this point it is thought that the leverage action of the neck of the femur is not sufficient, a bone fragment, consisting of the tip and the outer surface of the trochanter of a varying length approximating 3 inches, is removed with the thin osteotome (figs. 1 and 2), with the insertion of the abductor muscles intact, and swung outward from the shaft of the femur from 15 to 20 degrees, by producing a greenstick fracture at its lower end. Cancellous and fragments of cortical bone are then placed in the angulation between the remaining shaft of the femur and the bone fragment. The skin is closed by plain catgut number 0. Dressings and stickers to the thigh are applied. With the limb in moderate abduction, a plaster-of-paris spica is applied for three weeks, from above the costal margins on the opposite side to the toes, with stickers coming out through the plaster, above the ankle. From 15 to 20 pounds of traction with pulley and weight is maintained for three weeks after the removal of the plaster spica, or until a Taylor traction brace or Thomas knee-brace is applied, and locomotion with crutches is allowed.

Fig. 7.—Postoperative result of arthroplasty of knee showing V-shape of new-formed joint for purposes of stabilization.

This brace should be continued for at least three months before weight bearing is permitted, during which time daily massage and active and passive motion are carried out. Traction is most necessary and should be applied before the patient comes out from under the influence of the anesthetic, because of the devitalization and crushing effect that would otherwise be produced on the fascial graft by the involuntary contraction of the powerful thigh muscles. I have found that with a pulley and rope erected over the bed, fastened to a sling beneath the knee, the patient is able to help very materially in mobilizing the joint by pulling the hip into flexion (figs. 3, 4 and 5).

ARTHROPLASTY AT THE KNEE

To the patient with bony ankylosis of the knee, a functioning joint with adequate mobility and stability is his object in seeking an arthroplastic operation, even more than at the hip. Whether or not the surgeon follows anatomic contours in modeling the new joint does not interest him, so long as the joint functions. It has been found by Allison and Brooks that it is absolutely impossible to duplicate experimentally, or in

surgically constructed joints at the knee, the normal gliding of the articular bone surfaces. This being true, and as attempts to approximate the contour of the normal joint are so often followed by lateral instability, consisting of lateral buckling due either to capsular laxity or to side slipping of one joint surface on the other because of irregular wearing of joint surfaces, in 1920 I devised a technic,[3] based on well known mechanical principles, which ignores the normal contours of the joint and provides both mobility and stability. It has given excellent results.

In separating the tibia from the femur and in the bone modeling, wide V-shaped incisions replace the usual attempts to follow normal bony contours when viewed anteriorly. The convex wedge-shaped plane surfaces of the femur fit accurately into the concave wedge-shaped plane surfaces of the tibia. Weight bearing forces the apex of the wedge-shaped end of the femur so firmly into the tibia that the danger of lateral instability is practically eliminated, and a definitely improved prognosis is afforded.

Up to nine years ago, my own attitude concerning arthroplasty to produce mobility in bony ankylosed knees was one of great conservatism, both because of personal experience and because of observations which I had made on results of others. Either these patients had insufficient motion to satisfy them or, more often, the degree of mobility was satisfactory but lateral instability was present and proved so troublesome as to offset the advantages of mobility.

THE POSITION OF ANKYLOSIS

Extreme flexion is unfavorable to arthroplasty because it makes the technic very difficult and necessitates extensive removal of bone and the sacrifice of that portion of the tibia and femur which has the largest diameter, thus tending to produce lateral instability. If the knee is markedly flexed, it is advisable to perform a preliminary supracondylar osteotomy.

Five years ago I would have said that ankylosis in extension was best left alone; but in view of the constantly improving results from arthroplasty I believe that the patient should be given the benefit of the latter unless there are definite contraindications.

The condition of neighboring joints should also be considered. If both knees are ankylosed, arthroplasty on one is definitely indicated; or, if the knee and hip on the same side are ankylosed, there should be slight reason for hesitation.

To women, the awkwardness of ankylosis is more annoying than to men, and in young women ankylosis often proves a distinct handicap socially. For both men and women, the nature of their profession or occupation will often determine how essential mobility of the knee is to them.

In few operations is the absolute cooperation of the patient so essential as in arthroplasty. However perfectly the technic may be executed, a good functional result cannot be obtained unless the patient submits with patience, courage and intelligence to the long postoperative treatment, which is likely to be slightly painful in the first stages and is always tedious. It is wise to test the patient's nervous stability by telling him this in advance and to let his reaction to such a statement be an indication for or against the operation.

All persons of weak will or of excessive nervous instability and those who have a litigation interest in not getting better, such as certain compensation and accident cases, must be eliminated if the surgeon does not wish to risk unnecessary failures.

AGE AND SEX

Age and sex are not vital factors, although patients under 18 years are sometimes difficult to manage after operation; the operation should never be done on young children, and patients over 50 have not the same degree of resistance. It has been stated by some authors that men are more favorable subjects than women, but this has not been my experience.

TECHNIC OF CHOICE

A tourniquet is applied well up on the thigh, so as to allow postoperative application of plaster of paris before the tourniquet is removed.

The knee is approached by a U-shaped incision in the skin and soft parts from the inner and outer aspects downward to just below the tubercle of the tibia. The concavity is upward. This U incision gives the surgeon absolute uninterrupted access to all the parts involved in the formation of the new joint and is therefore distinctly superior to the lateral approach. Also it does not interfere with the important extensor apparatus above the knee, as is likely to happen with the inverted U incision or lateral approach.

The technic of arthroplasty should be so designed as to allow passive and active motion at the earliest possible moment without danger of separation of important structures. As the free gliding of the soft structures or "extensor apparatus" just above the knee joint is absolutely essential to free motion and active control, the severing and resuture of these structures, as in the inverted U incision, are to be avoided; for, if they are severed, not only is there danger of union being insufficient when one wishes to start exercises and passive motion as early as two weeks after operation but, because of the cross section severance, there is danger of adhesions at this point between the gliding intramuscular and tendinous tissues. These considerations lead me to choose an incision that does not section or traumatize these soft structures above the knee and to turn the patella upward rather than downward, as advocated by some.

When the knee is being opened up, care should be taken to leave the skin flap overlying the interior work as thick as possible, so that the skin and line of suture will not break down following the operation.

Before the patella is turned upward, the ligamentum patellae is detached with a generous amount of bone from the region of the tibial tuberosity, and including it in the dovetail manner indicated in figure 6. First, two holes for later insertion of kangaroo tendon are drilled, one through the tibial tuberosity and one slightly posterior to it. Then, by means of the motor saw and small drill, the tubercle of the tibia is removed with the ligamentum patellae, and the patella is turned upward. This bone plastic work is done very rapidly with the motor saw and, because of the dovetail mortise conformation and the rapid union of closely fitted broad bone surfaces to bone surfaces, the surgeon need not question the detachment of the ligamentum patellae —a question that has been raised by MacAusland, who considers it inadvisable to sever or disturb the patellar tendon or its attachment. It is distinctly preferable to detach this tendon, as trying to work around it involves unnecessary trauma to neighboring tissue, slows up the operation and limits access to the joint.

3. Albee, F. H.: Surg., Gynec. & Obst. 47: 312 (Sept.) 1928.

It is well known that bone unites to bone more readily and more firmly than tendon to tendon or fascia to fascia. My method of detaching the ligament takes advantage of this, the dovetail mortise conformation being a further assurance of prompt union and of the prevention against the pulling away of the tendon from the tibia even when bony union has not taken place. Also, prompt union obviates delay in the application of postoperative physical therapy, which should follow within two weeks after the arthroplasty. In marked contrast to this is the union of a severed tendon to tendon, which is both slow and unreliable.

After the ligamentum patellae has been thus detached, the soft tissue and capsule are dissected from the ankylosed joint to which they have become amalgamated, and the whole mass—patella, quadriceps and soft parts—is turned upward, exposing completely the anterior and lateral surfaces of the junction of the tibia and femur.

At this juncture the gliding of the lower part of the quadriceps muscle and its tendon on the lower end of the femur is tested, as well as their length. If this tendon and muscle do not glide up and down satisfactorily and are not of sufficient length, plastic work should be done to lengthen the tendon as well as to bring about its satisfactory gliding on the lower end of the femur. This is a very important feature of the operation, because if the tendon is not long enough to allow postoperative flexion, or if the quadriceps tendon is not free, serious interference with postoperative physical therapy or mobilization of the joint will occur.

It has been my practice to remove all immobilizing splints at the end of two weeks and to institute active and passive motion. If the quadriceps tendon were severed, this early postoperative treatment would certainly jeopardize union. Again, the severance of the quadriceps muscle and tendon and the dissecting downward of the distal portion seriously involve the gliding structures above the patella, which may not have been damaged or destroyed by the original pathologic changes that produced the ankylosis.

After the patella, quadriceps and soft parts have been turned upward *en masse,* one is ready for the bone arthroplasty. With a broad osteotome parallel, broad V-shaped incisions with the apex downward are used in modeling the joint anteriorly and posteriorly.

The lower end of the femur as viewed from its anterior surface, is shaped into a wedge with an angulation of 120 degrees between its plane surfaces. This leaves the tibia with concave plane surfaces at an angle of 120 degees to each other. These are in turn carefully modeled so as to receive with accurate fit the convex wedge-shaped surface of the femur. This is one of the original features of the operation and is an effective measure in the avoidance of lateral instability, in that, from a mechanical standpoint, weight-bearing forces the wedge contour of the lower end of the femur into the corresponding wedge shaped cavity of the upper end of the tibia. This peculiar contact practically insures stability, and consequently an unusual amount of laxity can be permitted by the removal of an ample amount of bone. A generous amount of bone, particularly at the posterior part of the joint, is removed from what was the tibia and femur, and the remainder is so shaped that it will imitate so far as possible the normal contour of the joint. Great care should be taken not to leave any blocks of bone attached to soft parts in the popliteal space because of the danger of their acting after operation as osteogenic material. It must be remembered, of course, that the removal of too much bone will favor instability, but the wedge-shaped method just described markedly diminishes this possibility.

Great care should be taken to leave the bony surfaces as smooth and plane as possible to facilitate gliding. This is usually best accomplished with a sharp, 1½ inch osteotome, but a file may be used, if necessary. A close study of the conformation of the bony surfaces of the new joint should be made in order to shape them most favorably for the function of joint motion. The proper conformation of the joint should then be tested by flexing the knee to beyond a right angle. Free motion without impingement at any point should be striven for, before the free fascia and fat graft are obtained. To insure this the patellar ligament with its dovetail bone fragment is replaced temporarily in the original mortise bed.

The joint is again flexed very cautiously to at least a right angle, to check up on the contours and to insure free excursion of the quadriceps tendon and muscle, so that postoperative physical therapy will not be prevented from securing the desired motion.

The joint is then packed with hot saline compresses, while a rectangular graft of fascia lata and fat is being obtained from the central portion of the outer aspect of the thigh. Being a semifluid substance, the fat under pressure after joint closure practically flows into the cavities and absolutely fills up all intra-articular dead spaces, thus preventing the formation of hematoma. For this reason the inclusion of fat with the fascia lata graft seems to me very valuable, and I cannot agree with those who advocate the use of fascia lata alone.

If sufficient fat can be obtained with the fascia, the superior portion of the graft is split and the undivided portion placed between the tibia and the femur. The fascial portion of the split end is turned upward and inserted between the lower end of the femur and the quadriceps tendon, and the patella, while the fatty portion is turned downward and placed between the upper end of the tibia and ligamentum patellae and the patella. The graft is sutured with chromic catgut number 1 to the remains of the capsule and soft tissues. The remains of the capsule are then sutured medially and laterally with chromic catgut number 1, the skin is closed with plain catgut number 0, and sterile dressings are applied.

Moleskin straps are applied medially and laterally to the lower leg for traction, and a cast is applied, so constructed as to allow for traction by means of the moleskin. The tourniquet is not removed until the plaster, applied from below upward, has reached it. Removal of the tourniquet before closure of the wound is to be condemned in that in an arthroplasty there are such broad surfaces of raw bone that the large amount of bone ooze cannot be controlled by ligature. Careful observation shows that a larger amount of bleeding will come from the cut bone surface than from the small blood vessels, which will escape ligature if the tourniquet is left on. The compression and immobilizing effect of the well molded plaster of paris with all joint spaces filled with the fat and fascia graft acts as a marked hemostatic influence, and it is therefore preferable to leave the tourniquet on during closure of the wound and application of the cast, thus preventing the very considerable oozing from the bone surfaces which would occur were it

removed. The hazard of hematoma is a real one and should be carefully guarded against.

A pulley and traction apparatus on the bed must be ready for immediate application when the patient returns from the operating room. The patient is held completely under the anesthetic until traction of 15 pounds (68 Kg.) is well established on the limb. This is done to prevent muscle spasm, which is likely to occur as the patient comes out from under the anesthetic and which might cause the approximation of the bone surfaces and the crushing of the fascia and fat graft between the bone surfaces. The latter might be a real calamity, leading to reankylosis.

This traction is continued for at least a month and a half after the plaster has been removed and the massage begun. Even after the patient goes home, the traction is maintained throughout the night, although during the day the patient is allowed to walk with crutches, without weight bearing, the latter not being permitted until at least two months after operation.

If, at the end of from three to six months, lateral mobility persists, Hey Groves recommends a second operation to reinforce lateral ligaments. This has not been found necessary with my technic, as in every case the joint has had most satisfactory lateral stability. But I have in several cases done secondary operations to sever restricting bands of fascia or scar tissue lateral to or above the patella which were limiting mobility, and the results have been excellent.

These operations have varied in degree from a short incision and the severance of a small band or two of fascia or connective tissue to an extensive operation in which even the new-formed joint has been entered and extensive soft parts have been severed.

I believe this is a rather radical step that has not been practiced by other men, and I feel very enthusiastic about secondary operations to overcome tissue contractures interfering with motion.

Pain does not usually persist after the first series of postoperative treatments.

The muscles gradually regain their ability to contract, even if they have been inactive for years; the reflexes reappear; the different types of sensation—superficial and deep, paresthesia, and sensation of position—are at length reestablished, as in a normal knee.

The nearthroses possess still another characteristic: once established, they are never the seat of effusion or of swelling. They seem to be resistant to all hematogenous arthritic processes.

The artificial joint created by the surgeon to relieve ankylosis is by no means an anatomically normal joint. It suffices that there is a joint which functions well (fig. 7).

PROGNOSIS

With proper selection of cases, meticulous attention to technic and intelligent postoperative physical therapy, the prognosis for arthroplasty of the knee is good.

With regard to the advisability of operating on a bony ankylosis due to tuberculosis, there is the greatest difference of opinion. I believe that arthroplasty should be approached with due conservatism in such cases, but not pessimism. If in the roentgenograms, which should be taken in several planes, there are evidences of rarefied pockets or cavity formation, or areas of extreme osteoporosis, the case is unfavorable; but if the bone structure appears fairly uniform and there are no other unfavorable conditions, arthroplasty should be successful. Some of my most brilliant results have been in cases of healed tuberculosis. It should be emphasized, however, that all vestiges of the original tuberculous process must have been entirely eliminated for at least four years before this operation is attempted and the roentgenograms should show an unusual homogeneity as to structure of the bone throughout the joint area. At least one year should have elapsed since the last symptom if the infection was pyogenic in character. It is rarely wise to operate in cases of arthritis deformans.

Next to the hip, arthroplasty of the knee has made the greatest strides during the last decade, and such operations on both joints should be recognized as a trustworthy surgical procedure.

INDICATIONS FOR ARTHROPLASTY

Those who have had the widest experience and the greatest success with arthroplasty are unanimous in urging careful selection of patients. In so doing, the following points should be considered:

1. The original cause of the ankylosis.
2. The position of ankylosis (flexion, extension, hyperextension).
3. The condition of the patient: not merely the general physical resistance but the condition of the soft parts overlying the joint. Extensive scar tissue, if it cannot be replaced with healthy tissue, is very unfavorable. Extensive adherence of the quadriceps tendon and muscle is also a handicap.
4. The psychic, social and occupational factors must all be weighed.

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KNEE JOINT ARTHROPLASTY

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In previous publications I have summarized and discussed the general aspects of ankylosis and arthroplasty of the knee joint. In this report, therefore, I shall present a few features of knee arthroplasty that have stood out prominently in our experience with the procedure at the MacAusland Clinic and show how a number of cases in which we have performed arthroplasties of the knee have withstood the test of time, as to both function and stability.

In our experience with knee arthroplasty, the complication of infection of the operative wound, from latent foci of infection, has been not infrequently encountered. This factor does not seem to have been stressed by other surgeons, and possibly they have not encountered it to the same extent. That the complication is not due to operative sepsis I am certain, because the infection has appeared too late after intervention. In the four cases of which I am giving detailed descriptions it may be noted that the infection could definitely be traced to a dormant focus situated elsewhere in the body.

CASE 1.—A man, aged 50, a rancher, had a complete ankylosis of the knee, as the result of a streptococcic infection from his tonsils eight years before we treated him. In spite of his age, all factors were conducive to success, and we considered the prognosis excellent. On the fourth day after the arthoplasty, the patient was somewhat uncomfortable from abdominal distention and gas, and for the next two weeks this distention continued to come and go. On the eleventh day after the

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arthroplasty, considerable pus was found under the skin flap covering the knee, but there was no definite indication of pus within the joint. By the eighteenth day the patient had a tense, swollen abdomen and was practically moribund, in spite of the efforts of four surgeons who had been consulted regarding the symptoms. Pus was found in the joint region itself. A laparotomy was performed and a gastric perforation found. The surgical and medical aspects of the case then progressed favorably. It is now eight years since the arthroplasty, and the patient has flexion of the knee to a right angle and is able to extend his leg completely. The joint is stable and painless. The patient rides with comfort and he is able to play eighteen holes of golf regularly without experiencing any ill effect.

CASE 2.—A man, aged 26, a state trooper, had a completely ankylosed knee as the result of "rheumatic fever." His general health was excellent. Ten days after an arthroplasty was done abscess of the jaw developed, and the knee wound became septic. The outcome in this case was poor. It has now been two years since the arthroplasty was done. The knee is again ankylosed, although the patella is slightly movable. Operation will probably be considered again in this case, although the knee is ankylosed at about a 12 degree angle and is therefore in excellent position for walking.

CASE 3.—A woman in the late twenties had had a multiple infectious arthritis. Arthroplasty of the knee was not performed until a year and a half after the acute process had quieted down. Six weeks after the arthroplasty, a subacute gonorrheal infection in the pelvis became active, and the motion, which up to that time had been free and painless up to 30 degrees, gradually shut down. There was no drainage at any time. The patient now has a stiff knee, and several other joints are ankylosed as the result of this acute infectious process.

CASE 4.—A man, aged 28, had a completely ankylosed knee as the result of sepsis following the use of tongs in the treatment of a fracture of the lower third of the femur. The arthroplasty of the knee was not performed until nearly two years had elapsed from the healing of the sinuses. When we opened the joint, we found some rust embedded in the old scar tissue around the tong holes, but it seemed to be so high above the joint, and so much time had elapsed since the active infection, that we anticipated no trouble. On the tenth day after the arthroplasty, however, there was a slight discharge from the original pin holes, and drainage continued from the posterior aspect of the knee off and on for a period of three months. The chances of gaining motion were thereby seriously interfered with. It is now over a year since the arthroplasty, and the patient is beginning to have a little free motion in the joint.

From our experience I conclude that a thorough examination of the patient before arthroplasty, for the purpose of determining any focus of latent infection, is of vital importance. I do not mean to imply that we have not checked the general condition of all our patients, but without doubt the examination has not been sufficiently thorough. Every possible site of a latent infection — pelvis, tonsils and teeth — must be carefully checked. I believe that if these precautionary measures are taken the number of cases of infection will be decreased.

Again I want to emphasize the well known maxim that an arthroplasty must not be performed until one is certain that the original acute process has quieted down. In our clinic we do not advise arthroplasty until one and one-half years after all signs of infection have disappeared. When the joint is ankylosed as the result of a tuberculous process, mobilization is approached with extreme caution, for such diseased joints may retain small walled-off foci throughout life. In the very rare case in which the health is excellent and in which there has been no evidence of an active process for years, a tuberculous joint may be mobilized successfully. On the whole, we consider that arthroplasty is not advisable in these cases.

The age of the patient is another factor that must be given careful consideration. The most favorable ages for arthroplasty are those from adolescence to 40 or 45 years, but a mobilizing operation is not definitely contraindicated later in life, provided the bone and musculature are in healthy condition. Such was the case in the two patients, aged 50 years, whose histories are given in detail elsewhere in the paper.

A second feature of knee arthroplasty that in my opinion should be stressed is careful modeling of the joint surfaces. This provision of the technic is emphasized for two reasons: first, to preserve the stability of the joint, and, second, to avoid the development of arthritic changes in later years. We never sacrifice stability for the sake of obtaining motion. It is better to allow the joint to remain stiff than to create a hypermobile joint, for an unstable knee, even when efficiently protected by a brace, is a handicap and subject to strain and the consequent development of arthritic changes. The preservation of stability presented a difficult problem in the early days of arthroplasty, but now, owing to the refinement of technic, one does not hear so much about lateral instability.

There is a provision made in our technic to preserve stability and to ensure a joint that will not be subject to arthritic changes.

OPERATIVE TECHNIC

A longitudinal skin incision is made, extending downward over the center of the patella. The fascia, quadriceps tendon and capsule are incised by means of either a goblet-shaped incision or a linear incision. The goblet-shaped incision provides for lengthening the quadriceps tendon when the knee has been stiff in extension for a long period. The patella is chiseled from the femur, exposing the tibiofemoral joint. The ligamentous structures are freed from their attachment to the tibia and the femur. Attention is now given to freeing the joint line and modeling the articular surfaces. The tibia is first separated from the femur by means of a gouge, the diameter of which corresponds to that of the femoral condyle in the adult. The articular surface is cut in such a fashion that two semicircular convexities are formed. As the operation proceeds, an assistant flexes the knee so that the remaining lamellae uniting the epiphysis of the posterior region are divided. About 1 cm. of bone is then removed from the femoral surfaces.

The tibial and femoral surfaces are now remodeled to conform as closely as possible to the normal contour of the joint. A well defined spine, corresponding to the intercondylar notch, is left between the concavities in the tibia to ensure stability.

The articular surfaces are next fitted to make sure that sufficient bone has been removed. The surfaces must glide smoothly without any irregular hitches occurring during flexion and extension.

A space into which the patella will fit is cupped out of the upper surface of the femur. As a rule, the patella will be found to be hypertrophied, and it is necessary to narrow it by first removing a third from each side longitudinally and then taking about one third from the joint surface of the remaining section.

The bone surfaces are smoothed by means of files and rasps. This filing, in addition to smoothing the edges, drives a bone dust into the open spaces, which aids in controlling hemostasis and, by roughening the surfaces of the resected edge, causes the aponeurosis of the fascial transplant to adhere more firmly.

The next step is to remove from the opposite leg a large piece of fascia lata, of sufficient size to cover both condyles, both tibial cavities, and the under surface of the patella. The operator first sutures the long flap of fascia over the tibial cavities, at their anterior surface. He then allows the flap to drop back into the popliteal space to a point about 2½ inches upon the posterior surface of the femur. The flap is then fixed to the lateral surface of the tibia with interrupted sutures. Next, the fascia is swept around the femur and wrapped over its anterior surface for about 2½ inches and tied tightly in place with a purse-string suture. The remaining part of the flap is then turned down and sutured to the top surface of the tibia.

The deflected flap, consisting of the patella, capsule, quadriceps and fascia, is replaced. The elongated quadriceps and capsule are sutured, and the skin is closed. A plaster bandage or intrinsic traction splint is applied with the knee in 35 to 40 degrees flexion. The leg is placed in an elevated position in bed.

The after-care must be carefully supervised. About two weeks after the operation, the plaster bandage is split and the leg placed in a ring caliper traction in 35 degrees flexion. This caliper is so arranged that knee motion is possible. By means of an overhead pulley, the patient begins passive motions while in bed, carrying them out usually two or three times a day. The movement should be gentle at first and then gradually increased. Active movements are attempted about the third or fifth week. Massage of the thigh and calf is begun in five or six weeks. About the sixth week the patient can usually walk with crutches. No actual weight bearing is allowed until the lateral ligaments have tightened.

The series of knee joint arthroplasties at our clinic has not been a large one, possibly because we have been extremely cautious in our selection of cases. Unfortunately, I am not able to give an analysis of our complete series, as we were not able to locate many of the patients, despite our painstaking efforts. From our group of cases I have selected five, in addition to the cases described at the beginning of the paper, on which we performed arthroplasties of the knee from six to twenty-three years ago. Our study shows that these patients secured stable and functional knees and that they have continued in this same status for over a period of years, without developing any arthritic changes.

CASE 5.—F. S., a man, aged 21, had a completely ankylosed knee as the result of a chronic infectious arthritis, which was superimposed on an injury to the joint when he was 8 years of age. Six months after the injury the knee was ankylosed in flexion, and we made two unsuccessful attempts to mobilize it by manipulation. It was twelve years before we saw the patient again, and meantime an arthritis had developed in the joint. The knee was ankylosed in 90 degrees flexion.

March 24, 1927, an arthroplasty of the knee was done. The case progressed favorably and the motion increased daily.

Feb. 2, 1933, nearly six years after the arthroplasty, the knee had function of 85 degrees and was a good weight-bearing joint. The only complaint of the patient was that the leg was fatigued after he had been standing on his feet all day at work.

CASE 6.—C. B., a miner, aged 50, had a fibrous ankylosis of the right knee, which had resulted from an injury to the lower part of the thigh four years previously. During the year following the injury, the joint had been aspirated and drained several times. When we first saw the patient, the sinuses had been healed for over a year, and the knee had been partially ankylosed for three years. The knee allowed 15 degrees flexion when the patient put his foot on the floor and pushed against the knee, but there was no voluntary motion. The patient's general health was excellent.

April 29, 1924, an arthroplasty was performed. The case progressed favorably.

In April, 1931, seven years after the arthroplasty, the patient had motion to nearly a right angle, and a good stable knee. Shorty after this report was made, the patient disappeared, and his family believe that he committed suicide.

CASE 7.—R. H., a woman, aged 24, had an akylosed patella following a comminuted condylar fracture of the lower femur.

Nov. 20, 1924, a subpatellar arthroplasty was performed. March 14, 1925, the patella was movable in all directions and the knee was stable. The patient was able to extend the leg voluntarily to within 15 degrees of full extension, but here the patella seemed to stop. A manipulation was done to break up the adhesions.

June 2, 1933, nine years after the arthroplasty, the patient had a stable and perfectly functional knee. Extension to 180 degrees and flexion to 90 degrees were possible.

CASE 8.—E. P., a woman, aged 30, in 1921 suffered an acute infection of the right knee, probably metastatic in origin from the tonsils. When we saw her in 1925, the knee was ankylosed in a few degrees hyperextension, with a slight knock-knee deformity. The patella was freely movable.

March 5 an arthroplasty was performed.

Feb. 13, 1933, the knee allowed function to 90 degrees and was practically, if not completely, stable. The patient told us that she had indulged in all activities for several years.

CASE 9.—F. O'K., a male, early in 1909, suffered an acute gonorrheal infection in the left knee. The joint was opened and treated. Following the attack the knee was in good position, but there was no motion between the tibia and the femur or between the patella and the femur. Manipulations were unsuccessful in restoring motion.

Dec. 14, 1910, an arthroplasty was performed.

In February, 1933, twenty-three years later, the patient had a stable and functional knee. Sometimes he has to think which is the knee that was operated on.

From our study of the status of restored knee joints after a period of years, in my own cases and in those of other operators, I am convinced that arthroplasty is to be considered a standardized form of treatment for ankylosed knee joints. By this measure a knee that is both functional and capable of enduring can be obtained. The use of this procedure in the knee joint, however, still presents an exacting problem, and its success depends on a most careful selection of cases as well as precise technic. It is my opinion that if arthroplasty is to continue to hold its place in reconstructive surgery of the knee joint, and to increase its scope, careful consideration must be given to the outstanding factors and complications observed in each operator's experience. From my own experience I am convinced that arthroplasty of the knee joint must be approached with particular regard to the following factors: (1) the selection of the case with reference to the age of the patient, and the lapse of time from the flare-up of an acute process; (2) the preparation of the patient with reference to the presence of foci of latent infection, and (3) the use of an operative technic that assures the restoration of a joint that is not only functional but also stable.

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ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. ALBEE AND MAC AUSLAND

DR. W. BARNETT OWEN, Louisville, Ky.: In 1904, Dr. Murphy published his article on arthroplasty. Shortly after it was my good fortune to observe four arthroplasties of the knee for ankylosis from tuberculosis. In each instance there was an absolute failure. Of course the technic of arthroplasty has been greatly improved by this time, but I am still of the same opinion that a joint ankylosed from tuberculosis should not

be subjected to arthroplasty. The indication for arthroplasty is principally in trauma, fracture, injury to the joint, ankylosis, and some pyogenic infections that have subsided. When that time is I am not prepared to say. I have operated in some of those cases and I thought that sufficient time had elapsed, only to find later that I was mistaken. I don't believe that one can tell when any joint is and will remain absolutely free of infection if operative intervention is instituted. Generally, I would say that more than 50 per cent of the limited number of cases I have had of arthroplasty of the knee joint have been satisfactory to me or to the patient. Arthritis has developed in a limited number. As is well known, arthroplasties of the jaw and of the elbow are much more favorably regarded because of the location of the joints. It is necessary to have stability in any joint, but that is not so imperative in a joint that is not weight bearing. One can have a very useful elbow that isn't absolutely stable, but it will have a good, painless range of normal and very helpful motion that is satisfactory to the patient. Dr. Albee has instituted new procedures that are unique and in his hands, I am sure, of great advantage.

DR. J. S. SPEED, Memphis, Tenn.: I am still of the opinion that there are economic reasons why one should refuse to do arthroplasties. I believe that the postoperative care and physical therapy are extremely important and that, unless the patient can afford to have these, arthroplasties should not be recommended to them. Patients who do hard manual labor should be chosen with considerable thought, for the reason that many of them will not obtain a knee sufficiently strong and durable to stand the stress of their occupation. One should also make sure that the muscular development of the extremities is brought up to the highest possible point before the operation is undertaken. I believe that tuberculosis is a definite contraindication. It is true that Dr. Albee and many others have obtained excellent results in tuberculous joints, but there have been many disasters following it. The serious results that follow the lighting up of an old tuberculous process in a joint far outweigh the occasional good results that may be obtained. Another definite contraindication to arthroplasty is the joint that has become ankylosed following osteomyelitis. The infection here has involved the bony structure about the joint, and deep seated foci of infection may remain active in such bones for an indefinite period of time. Any operation on such a bone is likely to be followed by a lighting up of the old infection. I have attempted arthroplasties on the knee in six cases with stiffness and deformity following osteomyelitis. In all these cases the infection was relighted and the arthroplasty a complete failure. I have come to the definite conclusion that arthroplasty should not be advised in joints ankylosed from osteomyelitis. I have seen an aseptic sequestration of portions of the newly formed condyles of the tibia or femur following arthroplasty of the knee with resulting irregularity of the weight-bearing surface of the joint and some instability. The cause for this aseptic necrosis is probably a disturbance in the blood supply of the bone at the time of operation. It is an interesting observation that the roentgenographic appearance of the joint following arthroplasty is not a true indication as regards its function. Many joints showing irregularities in the articular surfaces and the formation of osteophytes or exostoses about the joint have proved to be good functional joints. On the other hand, some that have shown remarkably good contours from a roentgenologic standpoint have either been painful or have not secured a satisfactory range of motion. I prefer not to gain motion too rapidly following the operation but to carry it along gradually, forcing an increase in motion as muscle development improves sufficiently to take care of it. I think that in this way many cases of instability in joints following arthroplasties may be avoided.

DR. EDWIN W. RYERSON, Chicago: The subject of arthroplasty is of such great importance that I think an attempt should be made to arrive at some unanimity of thought. I observed that Dr. MacAusland favors the Putti incision. I tried this incision in a long series of cases but had so much trouble with the lack of blood supply in the ends of the flap directed upward that I abandoned it, and I do not propose to use it any more. A straight incision down the front of the knee to the inner side of the patella, as mentioned by Dr. Speed, is satisfactory for any arthroplasty of the knee. I do not think that it is always necessary to detach the tubercle of the tibia, as shown by Dr. Albee, but it is very satisfactory and I have used this method a number of times in the last few years and find that it works extremely well. The bone of the tubercle of the tibia unites much more rapidly and more satisfactorily than does the quadriceps tendon when it is cut above the patella. The stability of the knee joint is a point that has been insisted on, in my opinion, too much, in certain classes of cases. Take a young woman who is employed at light work and who doesn't have to follow the plow. It is much to her advantage to have a knee that she can bend enough to get out of the way of other people in the street car or automobile or while sitting in the ordinary chair. I have questioned a number of young women on whom I have performed an arthroplasty of the knee, and although they had some lateral instability of the knee joint they were unanimous in stating that they much prefer to have a moderately unstable knee which they can get out of the way of other people's feet. Next about the ingenious method of Dr. Albee in cutting a V-shaped notch into the lower end of the femur: It seems to me that it is not good mechanically and I think that it would not be good practically. Most of his other ideas I agree with thoroughly. It doesn't seem reasonable to cut off the two most important weight-bearing parts of the lower end of the femur and to substitute for them the intercondyloid notch as the weight-bearing part of the knee joint. I don't think it is necessary, because I have so many good knee arthroplasties in cases in which the lower end of the femur was cut straight across in the proper way. I think that no tuberculous joint should ever have an arthroplasty performed on it. I have done two arthroplasties in a presumably healed tuberculous joint and the tuberculosis recurred in both. Next in regard to the type of infection causing the ankylosis: I think the gonorrheal ankylosis is by all odds the best to attack in an operative way. Next are those cases of infectious acute arthritis which used to be called acute rheumatism, in which ankylosis occurs rapidly. I will once more refer, as I have many times before, to the question of fat necrosis in arthroplasties of the knee. I have had seven cases of women who were very fat and on whom I did excellent knee arthroplasties. A fat necrosis occurred, at first apparently without any infection, and each one of those knees became reankylosed and the operation consequently failed.

DR. FRED H. ALBEE, New York: This discussion has been most interesting. There was, however, a misunderstanding concerning the wedge modeling. The purpose is not to allow the crest of this wedge to bear any more weight than any portion of the new joint surface. It is a convex wedge, the surface resting in a concave joint surface. When the limb is lifted from the floor the joint surfaces drop away from each other, allowing free motion. Weight bearing jams the wedge surface into a concave wedge cavity, thus giving lateral stability.

DR. W. R. MACAUSLAND, Boston: I think that some of the men do not understand why the quadriceps is elongated. I have no argument with anybody about an incision. The first question is: Does the joint check up as a functional and stable joint afterward? I prefer the Bennett elongation of the quadriceps for this reason: If one places a knee joint after arthroplasty in extension, one will have a lot of trouble gaining motion. I train the knees before arthroplasty and increase the muscular tone of the thigh by violent contraction of the quadriceps preparatory to operation. If a knee after arthroplasty is put in about 30 to 35 degrees flexion, even though the quadriceps has been cut (about which operation I have had not one bit of difficulty), earlier motion can be started. I begin at 35 degrees flexion and move to straight extension by the apparatus devised by Dr. Warren White for me. I start rather early motion by voluntary muscle contraction. That is the object of the Bennett elongation of the quadriceps as applied to arthroplasty of the knee.

Advances in Cardiology.—In this century there have been two notable advances in cardiology: first, the recognition of auricular fibrillation; and, second, the perception of coronary infarction as the pathological basis of one type of anginal pain —the "status anginosus."—Hay, John: Certain Aspects of Coronary Thrombosis, *Lancet* **2**:787 (Oct. 7) 1933.

PRECONCEPTIONAL AND PRENATAL INFLUENCES AFFECTING THE NEW-BORN

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In attempting to determine the causes of umbilical hernia in the Negro it was noticed that there was a definite relationship between variations in the incidence of hernia, birth rate, average birth weight, prematurity and deaths during the first week of life. Seasonal variations occurring consistently in each study strongly suggest the importance of the preconceptional and early prenatal periods and give some indications as to possible causes.

Since syphilis might influence some of these conditions, all cases in which either the mother or the infant showed a positive Wassermann reaction were excluded.

BIRTH RATE

There were 5,564 live Negro births in Atlanta during 1930, 1931 and 1932. There was an average of 491 infants born during the winter quarter, 458 in spring, 454 in summer, and 440 in the fall. The low rate of 440 in the fall corresponds to the group conceived during the winter quarter and the high rate of 491 to the group conceived in the spring.

AVERAGE BIRTH WEIGHTS

The average birth weight of two groups of white infants was determined to compare with that of the Negro. The private patient group of 955 white infants averaged 7 pounds 10 ounces (3,460 Gm.). The ward group of 1,801 white infants averaged 7 pounds 9 ounces (3,430 Gm.), and the group of normal Negro infants averaged 6 pounds 14 ounces (3,120 Gm.).

There is little difference in the white groups but nearly 12 ounces (340 Gm.) difference between the combined white groups and the Negro group.

Chart 1 shows the trend to seasonal variations in the two groups of 1,154 and 1,272 Negro infants. There seems to be a tendency to follow the curve of the average hours of sunshine for Atlanta for the same time interval. This tendency holds true for white infants. A more detailed study of birth weights will be published at a later date.

There is also a geographic variation in birth weights. In a study of approximately 1,000 white infants over a period of a year, E. D. Plass [1] reports for Iowa City an average of 7 pounds 5 ounces (3,320 Gm.). Martha Eliot [1] reports an average birth weight of 7 pounds 6 ounces (3,350 Gm.) from New Haven, Conn.

C. C. Rudolph [1] reports an average of 7 pounds 7 ounces (3,375 Gm.) from St. Petersburg, Fla., and the Atlanta average for white infants is 7 pounds 9 ounces (3,430 Gm.).

It would seem that there is a tendency for the average birth weight to increase in the southern portion of the United States.

UMBILICAL HERNIA

During the embryologic stage in development, the umbilical ring is the remains of the coelomic funnel as it passes through the linea alba.

Between the second and the third month of fetal life the intestine recedes into the abdominal cavity and leaves a depression in the wall which lies above and to the right of the umbilical arteries and below and to the left of the umbilical vein. Cullen [2] termed this the weak spot, and it is said to be the weakest place in the abdominal wall. It is the relaxation of this umbilical ring that allows the protrusion of the intestine and peritoneum, which make up the umbilical hernia contents. The umbilical fascia is present as a reinforcement in comparatively few cases.

Since these hernias appear during the first few days of life, the factors causing relaxation of the ring are unquestionably prenatal in time. Therefore it would seem probable that the presence of an umbilical hernia, in an otherwise normal infant, is caused by an inherent weakness in the connective tissue framework of the body. There is a simple relaxation of the ring and a stretching of scar tissue which could normally withstand the increased intra-abdominal pressure caused by crying and straining. It is probable that the weakness dates back to the early weeks of pregnancy or even to some deficiency during the preconceptional period. This is supported by the seasonal variations shown later.

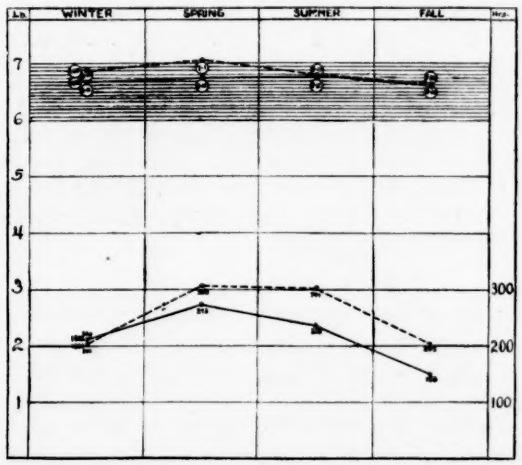

Chart 1.—Trend to seasonal variations in two groups of Negro births.

The incidence of umbilical hernia in 2,023 normal Negro infants was 270 per thousand. In 1,808 white infants the incidence was 82 per thousand.

In a study of the incidence according to the months of birth, the winter quarter showed an average of 260 per thousand; spring, 270; summer, 270, and fall, 386 per thousand. The group showing the highest incidence, in the fall, was conceived in the winter quarter.

PREMATURITY

In the Emory University Division of Grady Hospital, all Negro infants weighing 5 pounds 8 ounces (2,495 Gm.) or less are classed as premature infants. Stillbirths and syphilitic infants were excluded.

Prematurity was approximately twice as common in 3,255 Negro infants as in 1,801 white infants.

In a study of the seasonal variations in the rate of prematurity in the Negroes, it was found that there were 86 per thousand in the winter quarter, 108 in the spring, 86 in the summer, and 133 per thousand in the fall. The high rate corresponds to the group conceived in the winter quarter.

The viosterol for this study was furnished through the courtesy of Mead Johnson & Co.

From the Departments of Pediatrics and Obstetrics, Emory University School of Medicine.

Read before the Section on Obstetrics, Gynecology and Abdominal Surgery at the Eighty-Fourth Annual Session of the American Medical Association, Milwaukee, June 14, 1933.

1. Personal communication to the author.

2. Cullen, T. S.: Embryology, Anatomy and Diseases of the Umbilicus, Philadelphia, W. B. Saunders Company, 1916, p. 25.

There seems to be a possible relationship between the annual rate of prematurity in the Negro and the total hours of sunshine for the year, as shown in table 1.

The highest rate occurred in 1932, when the hours of sunshine were lowest. However, it is probable that other factors play a part in determining the rate.

DEATHS DURING THE FIRST WEEK OF LIFE

The following significant statement is taken from the report of the New York Health Commission [3] for the year 1932: "In the first six days after birth, one half of all infant deaths occur, and the greater proportion are due to prenatal and natal causes. Moreover, little change has occurred in fifteen years; the 40 per cent reduction in infant mortality between 1915 and 1930 has been due chiefly to the saving of life among older infants."

TABLE 1.—*Possible Relationship Between Rate of Prematurity and Hours of Sunshine*

Year	Total Hours of Sunshine (Atlanta)	Rate of Prematurity per Thousand Live Births
1930	2,830	109
1931	3,084	88
1932	2,630	113

Table 2 shows that the same is true of 5,564 Negro infants born in Atlanta during 1930, 1931 and 1932.

The seasonal variations in the rate of death during the first week of life for this group is as follows: winter quarter, 46 per thousand; spring, 41 per thousand; summer, 43 per thousand; fall, 58 per thousand. The group showing the highest rate (fall) was conceived in the winter quarter.

EXPERIMENTAL STUDY

An attempt was made to determine what effect, if any, viosterol might have on the infants of Negro mothers to whom it was given in the late weeks of pregnancy. One hundred and twenty-five mothers, with negative Wassermann reactions, were given 20 drops daily for an average period of six weeks before delivery. The average birth weight of ninety-three of these infants was 7 pounds 2 ounces (3,240 Gm.), as compared with an average of 6 pounds 14 ounces (3,125 Gm.) for 290 controls born during the same period.

TABLE 2.—*Negro Infant Mortality*

Year	Deaths During the First Year, per Thousand Live Births	Deaths During the First Week, per Thousand Live Births
1930	145	50
1931	118	52
1932	90	43

The incidence of umbilical hernia for the experimental group of ninety-three was 300 per thousand, as compared with an incidence of 270 per thousand for the average Negro infant.

The group is too small to be especially significant; however, it would seem to indicate that the birth weight was influenced favorably in late pregnancy, while the incidence of umbilical hernia was not affected. As previously brought out it would seem that umbilical hernia is influenced early in pregnancy.

3. Report of the New York Health Commission for 1932.

SUMMARY

Chart 2 shows a summary of the seasonal variations of the incidence of umbilical hernia, the incidence of prematurity, the birth rate and deaths during the first week of life. There is a sharp rise in the fall quarter for hernia, prematurity and deaths during the first week of life, and a decline in the birth rate.

A reasonable explanation is offered in following the arrows from the groups showing these changes to their period of conception, which occurs in midwinter. It is interesting to speculate as to what factors might cause these weaknesses in infants conceived in the midwinter months.

It has been brought out in this study that umbilical hernia, prematurity and deaths during the first week of life are much more common in the Negro than in the white infant.

The curve of birth weight shows a tendency to follow the curve of sunshine.

Negro infants conceived in the winter quarter show a decided increase in the weaknesses mentioned.

Since the pigmented skin of the Negro is known to filter out much of the available ultraviolet radiation it seems not unreasonable to suspect that deficiencies in vitamin D may play an important part in causing these defects and may partially explain the increased frequency in the Negro, especially when pregnancy begins in midwinter.

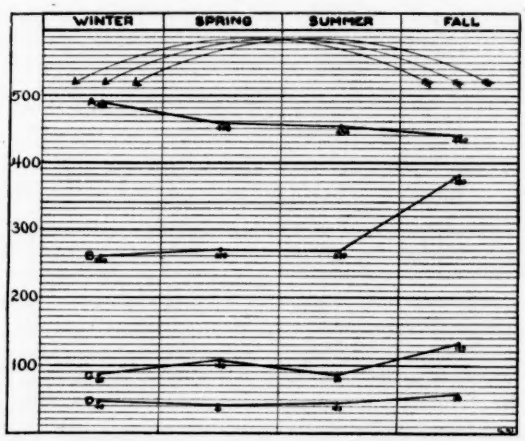

Chart 2.—Summary: *A*, average birth rate of 5,564 infants; *B*, average incidence of hernia in 2,023; *C*, average incidence of prematurity in 3,255; *D*, death rate in first week of life among 5,564 infants. The arrows point to the months of conception.

Maurer and Tsai [4] think that vitamin B complex deficiencies have an important influence on the pregnant mother. It is during the winter quarter that the average diet is most deficient in vitamin B complex.

CONCLUSION

It seems probable that the periods of greatest importance for the well being of the new-born infant are those months immediately preceding prgnancy and the early months of pregnancy.

205 Exchange Building.

ABSTRACT OF DISCUSSION

DR. FRED L. ADAIR, Chicago: Dr. Bivings has touched on vital influences which affect not only individuals but also social groups. The effect of these influences on the development of umbilical hernia would be of greater importance as the manifestation of a general law than as a condition in itself. In considering preconceptional influences, one has to consider

4. Maurer, Siegfried, and Tsai, L. S.: Illinois M. J. **61**: 30 (Jan.) 1932.

the hereditary influences that are carried in the genes of the various chromosomes of both germ cells and factors that influence the germ cells in whole or in part and are transmitted to the embryo and affect it in its individual development, the former being hereditary, as an integral part of germ plasm, and the latter being nonhereditary. Antenatal influences begin after fertilization takes place and are environmental but nevertheless modify more or less the hereditary and transmissible factors mentioned. So far as influences operating on the actual development are concerned, they must begin during the early weeks of gestation. Once tissue development and organogenesis are under way at two months' gestation, the remaining portion of intra-uterine life is largely one of growth. The pathology of this early gestational period is largely teratologic, while later intra-uterine life is subject to diseases affecting physiologic and anatomic growth. Umbilical hernia is a developmental tissue growth defect at the umbilical ring. This may be hereditary, as is indicated by the observation that this condition is more frequent in the Negro race. If it is due to any prenatal influences that affect embryonic and fetal development, they must operate in the early weeks of gestation before organ and tissue development are well under way. Factors affecting growth and extrinsic diseases may, of course, be potent during any period of gestation. Such conditions as congenital heart defect or spina bifida would have their roots in the preconceptional period or early embryonic life. Syphilis and other congenital infectious diseases might affect the growing progeny at any time. To be considered during these periods are (1) hereditary conditions and (2) nonhereditary transmissible disorders; (*a*) early manifestations of preconceptional factors and environmental influences on the embryo which cause either death or maldevelopment, and (*b*) late manifestations of maldevelopments due to the factors mentioned, disturbed growth, and the results of congenital disease derived from the mother, usually infections or toxic manifestations. These various disorders may cause embryonic or fetal death or neonatal death or may manifest themselves variously during infancy, childhood, adolescence, maturity or retrogression. These disorders are not solely physical and anatomic but are also physiologic and affect the structures of the central nervous system as well as the organs of digestion.

DR. RAYMOND L. SCHULZ, Los Angeles: Dr. Bivings is correct in stating that preconceptional conditions are the cause of these deformities. I am absolutely convinced of the correctness of the theory expressed by R. Clay Jackson. I will give some idea of how this system works. A predominance in the sex of the offspring has been accomplished in controlled experimental animals. For example, of a pair of rabbits, the male is kept in complete shade while the doe is kept out in the sunshine for a month or longer. During twilight and the night, proximity is permitted to insure mating at the expected time. The resultant litter will approximate 80 per cent males. By reversing the environmental conditions, a similar female predominance is secured. The sex of the offspring favors the sheltered parent protected from sunlight. Besides the sunshine-shelter differential, in man other factors come into play; namely, the relative weights of the parents and the colors of the hair and eyes. How are abnormalities produced? In bisexual conjugation, if there is a good contrast in the cellular potentials of the gametes, the stronger will impose its sex on the offspring. If the two gametic potentials are about equal, there will be a contest of two forces within the new organism, each trying to impose its characteristics on the offspring. These conflicts may result in constitutional disturbances, anatomic, endocrine, neurologic and immunologic subnormalities. This is the threshold of a new era, studying the pathologic results caused by incorrect human breeding. When parents will adjust their sunshine and shelter habits in accord with their natural gradients, they can be assured of obtaining 100 per cent perfect male or female products.

DR. LEE BIVINGS, Atlanta, Ga.: Dr. Adair mentioned the possible connection between defects I discussed and other defects. The great prevalence of rickets in the Negro is well known. It was not possible in my study of Negro infants to be able to examine each one, but I did so in the study of 1,608 white infants. I was unable to connect the incidence of umbilical hernia with rickets or any developmental defect. Many of the finest looking babies seen had umbilical hernias without any other sign of defect, without any evidence of rickets, or without any evidence of inguinal hernia. I think the cause of umbilical hernia and many other defects is probably active early in pregnancy or even before pregnancy occurs. Dr. Schulz commented on the effect of ultraviolet rays. The pigmented skin of the Negro filters out most of the ultraviolet radiation that he would ordinarily receive on the earth's surface. I attempted to correlate the effect of smoke and clouds and various conditions of that sort. There has been so little experimental work or actual tabulation of data on the subject of the effect of clouds and smoke on the ultraviolet rays that nothing exists on which to base a study. There has been some work done by the Mellon Institute in Pittsburgh in which it is shown that the seasonal variation in ultraviolet radiation is the same as sunshine, except that it is probably from 25 to 40 per cent of the total hours of sunshine quantitatively. Hess has shown experimentally that ultraviolet radiation as applied to rats is intercepted by the pigmentation. He took a group of white rats and a group of black rats and produced rickets by diet and then cured the rickets in the white rats but could not in the black rats because of their pigmented skin. The same thing naturally applies to the Negro. Rickets is very common, and the incidence of umbilical hernia and prematurity is much more common in the Negro than in the white race. I believe that the nutritional condition of the mother is the largest factor. Just what brings about the nutritional condition I cannot say, except that economic conditions do play a part. Dr. McCord knows that many of these mothers coming to the hospital for delivery are actually hungry. That is bound to have an effect on their offspring, particularly if the condition has existed throughout the entire period of pregnancy. Just why the seasonal rise is there cannot be explained on nutritional grounds alone.

RADIOTHERAPY AS A METHOD OF IDENTIFYING CERTAIN VARIETIES OF TUMOR

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ROCHESTER, MINN.

Among the methods of identifying and classifying tumors, microscopic examination has for a long time stood preeminent. Until now, in fact, it has been the only method by which substantial accuracy in the identification of neoplasms can be achieved. Without microscopic examination the classification of new growths would be as rudimentary as it was before the development of microscopic pathology. From the standpoint of science in general and medicine in particular, the microscope undoubtedly is one of the most valuable instruments ever invented. If microscopic examination of diseased tissue does not invariably lead to accurate identification of lesions benign or malignant, the fault does not lie with the instrument but with the human observer, the accuracy of whose observations and deductions depends on the quality of the optical system of the microscope, the acuity of his own vision, the range and depth of his knowledge of pathology and other phases of medicine, his experience and, finally, his general intelligence. A number of factors may make the task of the pathologist more or less difficult. The tissue that he receives may or may not have been an essential part of the tumor; the excised tissue may have come from a part of the growth that may not truly represent the neoplasm as a whole. The interval between removal of the specimen and examination may have been so long as to have allowed the tissue to

From the Section on Therapeutic Radiology, The Mayo Clinic.
Read before the Section on Radiology at the Eighty-Fourth Annual Session of the American Medical Association, Milwaukee, June 16, 1933.

degenerate. The specimen may have been improperly fixed, or the fixative may have undergone deterioration. The tumor may present unusual features or may be of a kind with which the pathologist may not have had extended experience. Under the circumstances, absolute accuracy in the identification of lesions is, from a practical standpoint, an unattainable ideal. As evidence it is only necessary to mention the common inability of pathologists of great experience to agree on the character of a given tumor. Moreover, pathology, like all other branches of knowledge, still has dark corners into which light has not yet penetrated. In spite of these difficulties, however, the ability of an experienced pathologist to identify tumors accurately in a large proportion of cases is quite remarkable.

Great as is the ability of the really competent pathologist to recognize the true character of cellular changes, the condition of tissues and the steps through which such alterations have been brought about, cases are occasionally encountered in which his interpretation proves to have been erroneous. Sometimes he alters his opinion spontaneously, or he may be forced to do so by subsequent developments which invalidate his original view. In other words, the pathologist as a human being is subject to error, and too commonly the clinician and surgeon expect too much from the pathologist, who cannot achieve the impossible. Moreover, the average physician has come to rely too blindly on the verdicts of the pathologist, and conflicting physical, clinical and roentgenologic data are sometimes disregarded when their analysis would lead to a more accurate diagnosis than unquestioning reliance on microscopic observations, which, for various reasons, may not be trustworthy. The excessive faith of many physicians has probably arisen from the close collaboration that has grown up between the surgeon and the pathologist. Exceedingly valuable as such collaboration undoubtedly is, because microscopic inspection of diseased tissues serves either to confirm or to correct the necessarily rough visual impressions of the surgeon, whose judgment would otherwise have to depend on unreliable surface appearances, microscopic examination of a tumor may not necessarily be conclusive. In spite of the accumulated knowledge and experience in this field of medicine, the identification, and especially the classification, of tumors are still surrounded by a certain measure of uncertainty. The most experienced pathologists frankly admit that they are often puzzled and uncertain. Indeed, the greater the knowledge and experience of the pathologist, the more ready he is to admit doubt or confess to actual ignorance.

My object is not to belittle the pathologist but to draw attention to the fact that, in some cases, another method of identifying and classifying certain varieties of neoplasms is available. The range of usefulness of this method is not nearly so broad as that of the pathologic method, but within its own range it is as dependable as, and sometimes actually more dependable than, the microscope. I refer to radiotherapy or, more specifically, to the reaction of certain kinds of tumor to roentgen rays or radium. Like the pathologic method, the radiotherapeutic method of identifying tumors is effective and dependable only when applied by an experienced radiologist or radiologic clinician who has had this phase of radiology specifically in mind for a sufficiently long time to have acquired assurance.

In the majority of cases the history, the clinical features and the physical observations furnish more or less definite clues to the nature of the pathologic process and to the organ or tissues primarily affected. In some cases, however, a high grade of clinical flair and extensive experience are required to solve what may appear as a complicated puzzle, but sometimes even then a measure of doubt may persist. It is at this point of uncertainty that the pathologist's report comes to solve the problem or to make the issue worse confounded. This depends on the ability and personality of the pathologist and on the training and faith of the clinicians who receive his report. If the pathologist has been trained to regard an embryonal carcinoma of the testis as a round cell sarcoma, and if the attending physician is not aware of the difference, the patient may pay for their ignorance with his life or with the loss of from several months to several years of useful activity. Or, a patient's symptoms being chiefly or wholly abdominal, and yet not pointing clearly to any one organ or structure, a surgeon may be called and the patient may be subjected to an exploratory laparotomy, when proper exposure of the abdomen to roentgen rays might, by causing the abdominal mass to diminish in size from 25 to 75 per cent in two or three weeks, have proved it to be Hodgkin's disease or lymphosarcoma, and the patient might have been saved from an unnecessary operation. Or, if the pathologist cannot distinguish between diffuse endothelioma of bone and osteogenic sarcoma, the patient may lose the chance of permanent cure which, though none too great at best, might result from well planned irradiation. In fact, the exceptional radiosensitiveness of endothelioma of bone was one of the chief points that led Ewing to recognize this variety of neoplasm as belonging to a distinct group.

THE RADIOTHERAPEUTIC METHOD

The radiotherapeutic method is based on the well established fact that each variety of cell in the body has a specific sensitiveness or, rather, a specific range of sensitiveness to roentgen rays or radium. This is not intended to imply that all cells of one kind, such as lymphocytes or squamous epithelial cells, react at exactly the same rate and to precisely the same degree to a given dose of rays. A certain measure of variation in reaction must occur, because different cells of the same kind are struck by the rays while in different stages of metabolism. Other still unknown factors also may play a part. However, if allowance is made for such variation, and if reaction time is taken as a criterion, the specific sensitiveness of each kind of cell looms up as the dominant single fact of radiology and deserves to be recognized as a law. And yet the existence of such a law and of its medical and biologic implications is not generally realized. For years much has been made of the dogma that pathologic cells are more radiosensitive than normal cells, but, as Lazarus-Barlow and others have shown, the foundation on which this dogma rests is not as broad as one might infer. The notion that pathologic cells are more radiosensitive than normal cells of the same kind is valid only to the extent that the rate of mitosis of cells is affected by the pathologic disturbance. The significance of this factor, therefore, is limited to tumors and to processes of which cellular hyperplasia is an important feature. Such influence is small as compared with the specific natural susceptibility of each variety of cell and with the age or metabolic status of the cells. Although the factors responsible for such specificity have not yet been determined, the sensitiveness peculiar to each kind of cell appears to be related chiefly to the

natural life cycle. Thus the lymphocytes, the metabolic cycle of which among human cells is the shortest, are also the most radiosensitive, and the nerve cells, the life cycle of which is the longest, are also the most resistant to irradiation. But to this question as to many others the final answer has not yet been given.

When, according to their radiosensitiveness, certain cells or groups of cells are exposed to a sufficient dose of roentgen rays or radium, the first perceptible effect is an alteration of or series of changes in the nuclear portion, or genetic mechanism, of the cells. These changes are characterized collectively by arrest of mitotic division and by partial or complete degeneration of the cells, and individually by disorganization and fragmentation of the nuclear chromatin, vacuolar degeneration of the protoplasm, rupture of the cell and scattering of the fragments of chromatin from the nucleus among the remaining intact cells. The chromatin débris is then gradually absorbed by phagocytes (phagocytic reticular cells or macrophages), while the liquid portion of the degenerated cells, together with the ferments and antibodies which they previously contained, is liberated, becomes mixed with the tissue fluids, and ultimately finds its way into the blood. Moreover, if the time intervening between irradiation and perceptible reaction is taken as a criterion, it will be found that certain species of cells react more rapidly than others to a given dose, or that the degree of reaction to the same dose is greater for some kinds of cells than for others. According to present knowledge, cells may be classified, according to their radiosensitiveness, in the following order:

Lymphoid cells (lymphocytes).

Polymorphonuclear and eosinophilic leukocytes.

Epithelial cells: (1) basal epithelium of certain secretory glands, especially of the salivary glands; (2) basal epithelium (spermatogonial cells) of the testis and follicular epithelium of the ovary; (3) basal epithelium of the skin, mucous membranes and certain organs, such as the stomach and small intestine; (4) alveolar epithelium of the lungs and epithelium of the bile ducts (liver), and (5) epithelium of tubules of the kidneys.

Endothelial cells of blood vessels, pleura and peritoneum.

Connective tissue cells.

Muscle cells.

Bone cells.

Nerve cells.

Thus, the epithelium of the skin stands about half way between the extreme radiosensitiveness of lymphocytes on the one hand and the comparatively great resistance of nerve cells on the other. Although the difference in susceptibility between the most sensitive and the least sensitive varieties of cells is considerable, none of the cells are wholly invulnerable to irradiation; all cells, whatever their variety, may be destroyed or injured if exposed to a sufficiently large dose of rays, especially if doses within the therapeutic range are disregarded.

The difference in susceptibility between lymphoid and epithelial cells is sufficient to enable one to distinguish readily between the two. Whereas lymphoid cells are rapidly influenced by moderate irradiation and undergo more or less marked inhibition of mitosis and degenerative changes within from half an hour to three or four days, corresponding changes in epithelial cells are caused only by a much larger dose of rays and do not become apparent for a week or even longer. A tumor derived from squamous epithelial cells never undergoes clinically perceptible retrogression within one or two weeks after irradiation, whereas lymphoid tumors usually begin to retrogress within from one to three days. The difference is so striking as to exclude all doubt. When such an example is presented to physicians who are unacquainted with the range of sensitiveness of different varieties of normal cells, they tend to assume that, as different tumors of the same kind vary somewhat in their susceptibility to irradiation, the difference might be accounted for in this way. But familiarity with the relative sensitiveness of cells and extended experience render such an explanation untenable.

As I have already intimated, such knowledge, by itself, can be applied effectively only to tumors derived from the more radiosensitive varieties of cells; but since its application may be both direct and indirect, the method may be of considerable value. To illustrate what is meant by direct or indirect application it is only necessary to mention a few examples. When the clinical and pathologic features of the patient's condition point to Hodgkin's disease or lymphosarcoma, and the response to irradiation confirms the clinical and pathologic features, this would be direct application of the method. But when the clinician or the pathologist, or both, regard the condition as one of carcinoma, but the reaction to roentgen rays indicates lymphoblastoma, this would be an indirect application of the method. Instead of direct and indirect, it might perhaps be better to speak of positive and negative applications of the method. At any rate, in tumors derived from radiosensitive cells, such as Hodgkin's disease, lymphatic or myelogenous leukemia, lymphosarcoma, embryonal carcinoma (often miscalled round cell sarcoma) and mixed, or teratoid, tumor of the testis, diffuse endothelioma (endothelial myeloma) and chondrosarcoma of bone, radiotherapy can almost always be depended on to furnish absolute diagnostic indications, irrespective of clinical or pathologic observations; so much so that, on this ground alone, the experienced therapeutic radiologist can render valuable assistance in the diagnosis of obscure or doubtful cases. Moreover, if the clinical data, the physical observations and the rate of regression of the tumor or tumors should agree in indicating any of the conditions mentioned, the resulting diagnosis will be supported by microscopic examination or, if not, the pathologist's interpretation will generally be found inaccurate.

By radiotherapy alone, the radiologist cannot distinguish between Hodgkin's disease and lymphatic leukemia or between the former condition and lymphosarcoma, but he can distinguish absolutely between any one of these conditions and any variety of epithelial or connective tissue tumor (carcinoma or sarcoma other than lymphosarcoma). He can distinguish lymphoblastoma from tuberculous adenitis. He can distinguish an embryonal carcinoma or a mixed (teratoid) tumor from tuberculosis of the testis. He can distinguish diffuse endothelioma of bone from chondrosarcoma or osteogenic tumor. In other varieties of tumor absolute distinction by radiotherapy alone is impossible, but correlation of the clinical, physical, roentgenologic and radiotherapeutic data may often settle the diagnosis without a biopsy or in the face of inconclusive or conflicting pathologic observations.

CASE 1.—A man, aged 36, who registered at the Mayo Clinic, May 6, 1924, had been well until November or December, 1923, when he began to suffer from a dull ache in the upper right abdominal quadrant. The pain was not constant and often radiated to the right groin and testis. He had been able to work steadily in spite of it. Besides hemorrhoids, a thorough

examination failed to disclose the cause of the pain. Internal and external hemorrhoids were ligated and excised, May 15, 1924, but this did not influence the abdominal pain, which continued, although a little later it shifted to the right lower quadrant of the abdomen. In May, 1927, a rather indefinite mass was found in the left epigastric region, and in January, 1928, the mass had become more definite, had increased in size and additional symptoms, including gas distention after eating, developed. An exploratory laparotomy was performed, Feb. 4, 1928, and the surgeon found a tumor which, to him, appeared to be carcinoma of the pancreas. A specimen from the tumor was examined microscopically, and the pathologist reported it as carcinoma, graded 4.

Between February 20 and 28, the patient was given a course of roentgen irradiation to the entire abdomen from front and back, through eight fields. This was followed by prompt regression of the abdominal tumor and by correspondingly rapid improvement in his condition. By April 11 he had gained 15 pounds (6.8 Kg.) and was much stronger. Except for a slight, occasional pain around the incision, the abdominal symptoms had disappeared, but a node in the left submaxillary region had become sufficiently large to attract the patient's attention.

After a second course of treatment, given between April 11 and April 16, 1928, the abdominal tumor and the symptoms disappeared completely. In November, 1928, the condition of the abdomen was normal, but lymph nodes in the right occipital, cervical and submaxillary regions, as well as in both axillae, were found enlarged. The nodes diminished rapidly soon after the neck and axillae were treated. From December, 1928, until February, 1933, the patient's condition fluctuated. At times fresh lymphadenopathy in the neck and elsewhere developed, but under treatment this subsided and disappeared for long periods, to reappear later. The condition of the abdomen was satisfactory for some time. Later, however, evidence of fresh lymphoid hyperplasia became apparent but disappeared after irradiation. It was necessary to treat the patient at intervals of from one to six months. Early in 1933 his general condition deteriorated perceptibly and he died, Feb. 20, 1933.

The rate of regression and of general improvement was characteristic of lymphoblastoma and quite different from the slow partial regression sometimes observed after radiotherapy directed against an epithelial tumor. So characteristic was the rate of regression that the assumption of carcinoma of the pancreas had to be discarded; it was obvious that the patient was suffering from lymphoblastoma, probably beginning in the retroperitoneal nodes. If, at the beginning of his illness, the symptoms had been due to carcinoma, it is hardly likely that he could have lived five years. On the other hand, the initial response of the abdominal tumor to irradiation, and later the appearance of lymphadenopathy in the neck, axillae, groins and even the mediastinum, clearly showed that the process was lymphoblastomatous and not carcinomatous and confirmed the indications furnished by radiotherapy, which in this case could not be reconciled with the pathologic diagnosis of carcinoma.

CASE 2.—A woman, aged 37, who registered at the clinic, Feb. 13, 1933, had noted the onset of urticaria, pain around the posterior aspect of the right hip, radiating down the right lower extremity, and a sense of pressure in the back and around the rectum, six or eight weeks before. A gynecologist had inserted a pessary, which the patient was still wearing. Another physician had injected varicose veins around the anterior aspect of the right thigh. Four weeks after the onset of symptoms (four weeks before her registration at the clinic), a mass had been found in the epigastric region, and the patient had been subjected to an exploratory laparotomy which had disclosed a tumor infiltrating the mesentery. A specimen obtained by the surgeon was submitted to pathologists, who accurately interpreted the tissue as lymphosarcoma.

Between Feb. 13 and Feb. 21, 1933, roentgen treatment to the upper half of the abdomen was followed by rapid regression of the abdominal masses and by corresponding improvement in the patient's condition. The rate of regression was absolutely characteristic of lymphosarcoma. A second course of treatment between April 17 and April 20, 1933, was followed by additional and equally rapid improvement. By March 14, 1933, the abdominal lymphadenopathy had diminished 60 per cent in size, and the patient's symptoms had completely disappeared.

This case is cited merely to show that the diagnosis could have been arrived at with equal accuracy without operation, merely by exposing the abdomen to roentgen rays in the proper manner. Irrespective of the pathologist's report, the history pointed to retroperitoneal lymphadenopathy as the cause of the patient's symptoms. If the physicians who had examined her previously had had experience with radiotherapy, the operation to which the patient had been subjected would not have been necessary. Exposure of the upper two thirds of the abdomen to roentgen rays of medium wavelength, through two anterior and two posterior fields, with the four beams of rays converging on the prevertebral nodes, would have been sufficient to establish the diagnosis within two weeks.

CASE 3.—A woman, aged 56, who registered at the clinic, March 1, 1933, had been well until three years previously, when she had noticed, in the epigastrum, a mass the size of a large orange. Her impression was that the size of the tumor had remained about the same for six months or longer and the growth then gradually disappeared. In the fall of 1932 the epigastric tumor reappeared and gradually increased in size. Also the abdomen became more and more distended. During the few weeks prior to her coming to the clinic the epigastric mass had grown rapidly, had caused pressure symptoms and had been accompanied by shortness of breath, but at no time had the patient suffered from pain.

The abdomen was moderately distended and contained fairly large, softish masses in the epigastric and umbilical regions as well as in the left iliac region. The peritoneal cavity and both pleural cavities contained a small quantity of fluid. March 3, 1933, a diagnostic aspiration of the right pleural cavity was performed, and 1,250 cc. of thick milky fluid was withdrawn. Some of the fluid was used for culture, some for guinea-pig inoculation, and some for determination of chyle. Evidence of tuberculosis could not be obtained, but it was definitely established that the fluid was chylous in character.

A course of roentgen treatment was given to the upper two thirds of the abdomen and to the entire thorax between March 6 and March 14, 1933. This caused rapid regression of the abdominal masses and equally rapid diminution in the intrathoracic fluid. The cough and dyspnea also subsided rapidly. The rate of regression was exactly what would be expected in lymphoblastoma and thus confirmed the clinical impression. Regression of the abdominal tumors continued during the ensuing few weeks and all the patient's symptoms disappeared.

In spite of the circumstances mentioned, the general condition of the patient throughout her illness had remained relatively good, especially if the duration of the illness and the physical observations were taken into account. The patient's impression that the abdominal tumor had disappeared spontaneously about six months after its initial appearance must not be taken literally but merely indicates that the mass or masses diminished in size sufficiently to give the patient the impression that they had vanished. It is well known that certain varieties of tumor vary in size from time to time, and sometimes such variations are sufficient to give a patient the impression that the tumor has disappeared when it actually has not. Clinically, it seemed obvious that the pathologic process had started in the paraaortic lymph nodes around the celiac axis, just below the mouth of the thoracic duct, through which it had extended upward and had blocked the duct in the thoracic portion of the posterior mediastinum, causing

chylous fluid to accumulate in both pleural cavities. Under the circumstances, the natural assumption was that the patient had lymphoblastoma. If radiotherapy had not been used for differential diagnosis in this case, it is possible that the patient would sooner or later have been subjected to an operation, which would have been essentially useless as far as the patient was concerned.

In contrast with different forms of lymphoblastoma, tuberculous processes respond much more slowly to irradiation, and complete regression usually requires that the affected region be exposed to the rays at regular intervals for from three to twelve months, or even longer. The difference in radiosensitiveness between lymphoblastomatous adenopathy and tuberculous adenitis is so great as to leave no room for doubt. Significant and valuable as this point may be in relation to enlarged nodes in superficial parts, such as the neck, it is of still greater value when the enlarged nodes are situated in the mediastinum, where the clinical features tend to be less distinctive and where a biopsy cannot help the clinician out of his dilemma. The following is a case in point:

CASE 4.—A woman, aged 53, who registered at the clinic, March 8, 1928, had noticed for six or seven years that her heart missed an occasional beat at night and that this interfered with sleep. Thenceforth she had attacks of vertigo and fatigue, from which she could obtain relief only by lying down. Her pulse rate had been more or less steadily elevated, but electrocardiographic examinations in 1927 had not disclosed any definite disturbance in the cardiac rhythm. During the month preceding registration, the right side of the neck had swelled and become sore, and a slightly enlarged node adjacent to the right sternomastoid muscle had become palpable. This was accompanied by occasional soreness on the right side of the neck. It seemed most likely that, since the tonsils and one tooth had been infected for some time previously, the slight cervical adenitis might have resulted from such infection. Accordingly, she was advised to have the tonsils removed and the tooth extracted. Tonsillectomy was performed, April 4, 1928, and these glands showed chronic inflammation, fibrosis, pus and ulceration in the crypts. Subsequently the soreness on the right side of the neck increased, the enlarged nodes on this side did not recede, and other nodes on the same side also enlarged.

May 21, 1931, pus was evacuated, some of the enlarged nodes on the right side of the neck were removed surgically, and microscopic examination showed these nodes to be tuberculous. A roentgenogram of the thorax, May 18, 1931, showed circumscribed broadening of the upper mediastinal shadow. This was assumed to be due to enlarged mediastinal lymph nodes, and the previous history made it seem likely that these nodes were tuberculous. On this assumption roentgen treatment was instituted, the patient receiving the first course between June 29 and July 1, 1931. The treatment was directed to the mediastinum and to both sides of the neck. A second course of treatment was given between July 27 and July 29. By this time the condition of the patient had improved considerably, the lymph nodes in the neck had almost disappeared, and a roentgenogram of the thorax, Aug. 24, 1931, showed substantial retrogression of the enlarged mediastinal nodes. Moreover, the rate of such regression confirmed the clinical and roentgenologic assumption of tuberculous mediastinal adenitis. Additional courses of treatment were given between Aug. 24 and Aug. 26, Sept. 21 and Sept. 22, and on Dec. 7, 1931, when the roentgenologic appearance of the thorax was normal and the enlarged nodes in the right side of the neck had disappeared. The patient's condition has been entirely satisfactory since that time. An interesting point also is that the tendency of the heart to miss an occasional beat, the abnormally high pulse rate and the undue tendency to fatigue have disappeared and the patient is well.

In this case, it is true, the character of the enlarged nodes in the neck made it seem most likely that the mediastinal adenopathy also was tuberculous. Still, the clinical and roentgenologic features were not sufficient to remove all doubt; but the response to irradiation cleared away all uncertainty. Of course, if the tuberculous process in the mediastinal nodes had undergone calcification, radiotherapy could not have had the same effect.

Radiotherapy may also enable one to distinguish embryonal carcinoma and mixed, or teratoid, tumor of the testis, whether in their primary site or in their most common, abdominal or supraclavicular, sites of metastatic dissemination, from other kinds of neoplasm with which they may sometimes be confounded. Being derived from the spermatogonial cells, embryonal carcinoma (not adenocarcinoma) of the testis is just as radiosensitive as the parent cells of the normal testis, which rank next to the lymphoid cells and to certain mucus-secreting epithelial cells (salivary glands) in their susceptibility to roentgen rays and radium. The sensitiveness of mixed, or teratoid, tumors is sometimes as great and apparently depends on the proportion of spermatogonial epithelium entering into their composition.

In bone tumors, also, radiotherapy often furnishes invaluable diagnostic indications. As pointed out by Ewing and as I have recently emphasized, the susceptibility of solitary endothelioma of bone to roentgen rays or radium is so pronounced and so characteristic as, by itself, to constitute a most valuable means of differentiation. As a class, bone tumors derived from cartilage are, in respect of their susceptibility to roentgen rays or radium, intermediate between the solitary endothelioma and the osteogenic sarcoma, but the difference between chondrosarcoma and endothelioma is greater than the difference between chondrosarcoma and osteogenic sarcoma. By sufficiently intense irradiation chondrosarcoma can be made to retrogress perceptibly and sometimes to a considerable degree for a limited period of time (weeks or months); but, as in osteogenic sarcoma, complete and permanent disappearance of such a neoplasm is rare. Nevertheless, such retrogression as does occur usually proceeds at a more rapid rate, is more pronounced and lasts somewhat longer than in the osteogenic tumor. In most cases the difference in radiosensitiveness between these three types of neoplasm is sufficient to distinguish them clearly, irrespective of clinical, roentgenologic and pathologic indications. Of course, when the results of radiotherapy support the clinical, roentgenologic or pathologic observations, the weight of evidence becomes overwhelming.

CASE 5.—A boy, aged 16 years, who registered at the clinic, Dec. 1, 1932, had always been well until four months previously, when he noticed a dull, intermittent ache around the anterior aspect of the lower third of the left thigh. Except that, while baling hay during the summer he had used this thigh to assist in loading the bales, neither he nor his father recalled any injury to which the pain could be attributed. Gradually the pain had increased in severity and become more constant. At no time had the patient been aware of fever, and his weight was normal. During the previous two or three weeks, slight swelling of the lower part of the left thigh had become apparent, but the color of the overlying skin had remained normal. Walking had not been affected appreciably, and the boy had been able to ride a horse for five miles daily, on his way to and from school; but running caused the pain to increase. The function of the joints had not been disturbed.

Examination disclosed slight widening of the lower part of the left thigh, which measured 1.5 cm. more than the right thigh; also tenderness and slight limp on walking. Roentgenograms showed diffuse widening of the lower third of the left femur, with concentric deposition of new bone in the periosteum and decrease of central density. These features were

regarded as representing solitary diffuse endothelioma (Ewing). Evidence of intrathoracic metastasis could not be found. The "onion skin" appearance of the left femur at the level of the tumor was so classic that even the orthopedic surgeon did not hesitate to regard the tumor as endothelioma. To the surprise of every one, however, microscopic examination, by Broders, of tissue removed from the tumor, Dec. 4, 1931, brought the report of "osteogenic sarcoma (graded 2), differentiating for the most part in the direction of cartilage."

If the tumor should react to irradiation like true osteogenic sarcoma or like chondrosarcoma, the onion skin appearance of the new bone as an indication of endothelioma would have to be disregarded. On the other hand, if the growth should perchance retrogress at the rapid rate so characteristic of Ewing's endothelioma, the pathologic interpretation would have to be revised.

The father having refused to consider amputation, between Dec. 7 and Dec. 9, 1931, the region occupied by the growth was irradiated with six beams of rays of medium wavelength (generated at 135 peak kilovolts and filtered through 6 mm. of aluminum). The pain, which previously had been rather severe, diminished rapidly. The tumor also retrogressed, but the rate of regression was that of chondrosarcoma rather than endothelioma. Between Dec. 31, 1931, and Jan. 2, 1932, the patient was given a second course of treatment. When he returned, February 16, he was free from pain and the tumor had retrogressed further, but it was clear that the neoplasm was not an endothelioma. A third course of treatment was given between February 16 and February 17. Roentgenograms, April 7, 1932, indicated slow but continued improvement in the condition of the left femur. The patient was allowed to go home without treatment but was instructed to return in three months. Before this interval had elapsed, the father wrote that the pain had reappeared and was increasing, and that the lower half of the left thigh was swelling again. Amputation was again advised, but the father again refused to follow this advice. Therefore, another (fourth) course of roentgen treatment was given between June 30 and July 1, 1932. The pain abated and the swelling appeared to subside for a short time, and roentgenograms, July 21, revealed definite recession of neoplastic activity, but it was obvious that parts of the growth were still active.

When the situation was again discussed with the father, he finally consented to amputation, which was performed by Dr. F. C. Thompson, at St. Joseph, Mo. A large specimen of the tumor from the amputated limb, furnished by Dr. Thompson, was subjected to microscopic examination by Dr. Broders, who described the growth as follows: "This neoplasm, which is of a low grade 2 malignancy, belongs to the general class of osteogenic sarcoma; however, while there is some tendency to bone formation, its cells for the most part are differentiating into cartilage of a more or less atypical nature. In the undifferentiated areas, one sees practically normal cartilage cells; however, in these areas also there are a few cells with large, irregular, hyperchromatic nuclei and in which the amount of cytoplasm is abnormally large."

The significant points are that a tumor of the femur, with features apparently so characteristic of the solitary diffuse endothelioma described by Ewing, should have failed to react to roentgen rays in the manner and at the rate peculiar to tumors of this kind; that its radiotherapeutic behavior and its pathologic features should so absolutely and conclusively have concurred in establishing its essentially cartilaginous character; and that in this case, as perhaps in other cases, the laminar deposition of new bone in the outer layers of the neoplasm, or so-called onion-skin effect, should have proved unreliable and actually misleading as a diagnostic sign. The response of the tumor to repeated and intense roentgenization corresponded in all respects to the usual reaction of malignant tumors derived from cartilage; distinctly more radiosensitive than true osteogenic sarcoma and much less sensitive than Ewing's solitary endothelioma, it furnishes additional evidence, if such were needed, of the great value of irradiation as a means of distinguishing different varieties of tumor.

If space were available, many other examples of the practical value of radiotherapy as a means of identifying certain varieties of tumor could be cited. Also, if pathologists and others were familiar with the relative radiosensitiveness of different kinds of cells, such knowledge would undoubtedly furnish data that would prove significant for purposes of classification. Indeed, it is safe to say that, as internists, surgeons and radiologists acquire experience and become familiar with the relative radiosensitiveness of neoplasms, there may be a tendency toward excessive dependence on the method. Also, it is certain that, when a greater number of pathologists come to realize the significance of the specific range of sensitiveness of different varieties of cells, this fundamental law may help to solve certain problems in cellular physiology, histology and pathology which, until now, have remained insoluble.

ABSTRACT OF DISCUSSION

DR. NORBERT ENZER, Milwaukee: It is not appreciated often enough that the submission of a small piece of tissue to the pathologist places on him a considerable responsibility. The pleomorphism of tumors is perhaps the greatest danger. The classification has been rather confusing, and an understanding of the primary cell origin is needed. Cells may be and indeed are "multipotential" and develop different types of tissue under different stimuli. For example, lymphoblastomas and connective tissue tumors are derived from mesenchyme. It is important that the purely descriptive form of classification be discarded. As Dr. Desjardins mentioned, it is important that physicians learn to separate the granulomas that have peculiar features, clinically resembling neoplasms but pleomorphic in their cell structure. Such lesions probably do not take origin from a single stem cell. I am referring particularly to Hodgkin's granuloma. In the interpretation of x-ray sensitivities, a differentiation should be made between tumors that are unicentric, if I may use the term, or local in origin, as opposed to those which are polycentric, or systemic in origin. I am referring to certain types of lymphoblastoma that arise spontaneously in several depots in the body, as opposed to lymphoblastomas that arise, for example, in the cervical region or other lymphoid depots. While sarcoma of the testis does occur, the great majority of malignant tumors of the testes are embryonal carcinomas. Such tumors take origin from primitive germ layers. Sarcoma of the testicle is usually a lymphosarcoma. It is possible that these tumors take origin in primitive mesenchyme in which the lymphogenic tissue is abnormally stimulated or developed. In other words, these tumors, sarcoma of the testes, while morphologically lymphogenous, may in reality be properly classified as embryonal carcinoma.

DR. A. U. DESJARDINS, Rochester, Minn: I am very grateful to Dr. Enzer for his remarks. I should be the last man to cast aspersions on the pathologist. What I meant to bring out was that the radiosensitiveness of tumors is becoming a valuable point in diagnosis, but on condition that the interpretation is done by some one who not only has had adequate experience but whose mind has been focused on this particular point long enough to develop assurance. I realize the danger of any one without sufficient experience and without having his mind specifically on the point attempting to do it, because not only will he get into trouble but he will get others into trouble, including the patient. So far as the diagnostic value is concerned, radiotherapy has both a positive and a negative value and therefore a double value, because it enables one not only to recognize a suspected lymphoid tumor but also to exclude other tumors when a lymphoid tumor is suspected, and vice versa. As applied to tumors of bone, radiotherapy makes it possible to distinguish endothelioma from chondrosarcoma, and also chondrosarcoma from osteogenic sarcoma. In an occasional case special difficulties may be encountered, but these are exceptional.

RELATIVE MERITS OF SPINAL AND ETHER ANESTHESIA

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Surgery involves many controversial subjects which add interest to medical discussions and zest to meetings whenever doctors get together. Spinal anesthesia is a recent example, for no method has had stronger partisans ready to defend, on the one hand, or to condemn, on the other. As has been the case with most surgeons, we have been greatly interested in the question of the relative merits of this anesthetic and anxious to know the truth of the matter. On finding recently that sufficient material from which to draw conclusions had accumulated in our own clinic, we attempted to determine the nature of our own results. With no analysis having been made at the time and, therefore, without bias, we offered to read a paper entitled "The Relative Merits of Spinal and Ether Anesthesia" before this section and so, with an open mind and with no attempt at prophesying what our conclusions would be, we set about making a comparative study of the results following the use of the two forms of anesthesia, ether and spinal, in a series of operations performed under closely similar conditions.

It was with a sincere desire to determine the actual facts pertaining to the relative safety of spinal and ether anesthesias and with a resolve to steer a middle course between immeasurable enthusiasm, on the one hand, and unjustified condemnation, on the other, and to rely only on carefully collected data, that the study was made. The investigation was carried out on a series of major procedures all performed by one of us (H. L. F.), except for a few performed by an assistant, in the same hospital and operating room and with the same personnel; 4,000 consecutive operations were performed, one half under ether anesthesia and the remaining half under spinal anesthesia. By ether anesthesia we refer to ether, or ether plus nitrous oxide or ethylene, but in which no spinal anesthesia is used; by spinal anesthesia, subarachnoid injection of procaine hydrochloride supplemented in a few cases by nitrous oxide and ethylene. Every anesthetic was administered by one of three trained anesthetists who had devoted many years exclusively to this work and who, therefore, were experienced and skilled. We have not resorted to spinal anesthesia in closed fracture reduction; hence, no such cases are included, while such procedures as cystoscopic examinations and other similar minor procedures, occasionally performed under spinal anesthesia, are, of course, not listed. All the procedures herein described come well within the category of major operations (table 1).

The operations, whether with ether or spinal anesthesia, were all consecutive and were all performed on structures below the diaphragm. Since the types of operation and the lesions for which they were performed were about equally divided between the two anesthetic methods, the study is fair and comparable. It seemed, therefore, that a review of the anesthetic results, the patient's reaction and condition during and after the procedure, with, especially, a comparative analysis of the mortality figures in these two closely paralleled lists of operations, would cast an interesting light on the relative merits, advantages and dangers of the two anesthetic agents.

Safety in an anesthetic, as all will agree, is of the first importance, and while we appreciated the manifold advantages of spinal anesthesia, yet we realized that it possessed certain inherent dangers. How great were these dangers? Were they actually greater than those possessed by ether and, if so, in what degree, and were they of sufficient moment to contraindicate our continuance of this method of producing insensibility to pain? These questions first arose when, after several hundred spinal anesthesias, we had a sudden and inexplicable death occurring several days postoperatively. Because of this fact, for a time, spinal anesthesia was discontinued when, most unexpectedly, another death occurred, but this time with ether, a death equally difficult to account for. This recalled to mind Lundy's [1] careful analysis of a large series of operations under ether, performed at the Mayo Clinic, which clearly showed that even accompanying ether there is, not infrequently, a concealed and delayed mortality, a fact often disregarded, especially by those who are opposed to spinal anesthesia. It has been our observation, as it has been Pemberton's,[2] that there is a "tendency for the surgeon to attribute to the anesthetic or its mode of administration any unusual complication which cannot readily be accounted for otherwise."

TABLE 1.—*Classification of 4,000 Operations Under Ether and Spinal Anesthesia*

Operations	Ether	Spinal
Amputations	26	29
Appendectomies	458	449
Exploratory laparotomies (chiefly for carcinoma)	123	103
Herniorrhaphies	217	281
Operations on bones and joints	29	21
Operations on gallbladder and ducts	366	270
Operations on kidney, bladder and prostate	50	115
Operations on pelvis	477	412
Operations on stomach and intestines	153	230
Open reduction of fractures	27	28
Splenectomies	4	2
Miscellaneous	70	60
Total	2,000	2,000

In our experience an occasional remote death, occurring a week or two postoperatively and, in certain cases, impossible to understand, occurred following spinal anesthesia, but, as has been stated, they also occurred following the use of ether. As some one has said, it is our business to see that our patients leave not only the operating room alive but the hospital as well, and the patient is just as dead when he dies three weeks postoperatively as he is when he dies on the operating table. Much of the extensive literature on the subject was read, but it finally appeared that no personal conclusions could be drawn, in spite of the widespread claims for and against spinal anesthesia, until a sufficient number of patients had been operated on in our own clinic and the results carefully analyzed.

Although spinal anesthesia greatly facilitates the work of the surgeon, the question arises: Does this most desirable advantage offset the anesthetic's alleged dangers, if dangers it has, and should the method be reserved only for those cases in which technical facility

From the Department of Surgery, Geisinger Memorial Hospital.
Read before the Section on Surgery, General and Abdominal, at the Eighty-Fourth Annual Session of the American Medical Association, Milwaukee, June 14, 1933.

1. Lundy, J. S.: Incidence of Pulmonary Complications Following Ether and Ethylene-Ether Anesthesia for Surgical Procedures in the Upper Abdomen, M. J. & Rec. **124**: 87-93 (July) 1926.
2. Pemberton, J. de J.: Proc. Soc. Staff Meet., Mayo Clinic **8**: 308 (May 17) 1933.

is of transcendent importance? Can it with safety, comparable to that of inhalation anesthesia, be used more or less as a routine measure in operations below the level of the diaphragm? If this is true, but few of us who have had much experience with spinal anesthesia would wish to use anything else, so satisfactory is it. And so it was with these and many other closely associated questions in mind that the study was undertaken.

The mortality figures for the series do not, of course, represent those of our surgical service as a whole; they are considerably higher, as should be made clear, owing to the fact that all the serious abdominal operations are included, and the operations performed on the thorax, head and neck, when the anesthetic has been local or gas or a combination of these, and operations carrying lower mortality figures than the more formidable operations in the abdomen are excluded. Moreover, in a medical center serving a widespread rural territory, it is obvious that surgical disease is of a more serious nature when first seen at the hospital than in the city institutions where physicians' offices and hospital dispensaries are readily accessible and where the patient becomes accustomed to resorting to them promptly. The rural patient is apt to keep his complaints long to himself until finally driven to seek relief, this fact having been noted by all who work in clinics serving far-flung rural sections. As an illustration, a fifteen years' average shows that our patients with acute appendicitis are admitted seventy-two hours after the onset of symptoms; patients with carcinoma of the colon, thirteen months after. These points are merely made in extenuation, if it is necessary, for the mortality figures appearing in the paper.

POSTOPERATIVE DEATHS WITH SPINAL ANESTHESIA

Authors writing in defense of spinal anesthesia have frequently stated that they have had no deaths which, to use their expression, "by the widest stretch of the imagination, could be attributed to spinal anesthesia";

TABLE 2.—*Mortality in 4,000 Operations*

2,000 Consecutive Operations under Spinal Anesthesia		
Deaths	140	
Mortality	7%	
Deaths in operating room	1	
Percentage of deaths under spinal anesthesia in the operating room to total deaths under spinal anesthesia	0.71%	
2,000 Consecutive Operations under Ether Anesthesia		
Deaths	137	
Mortality	6.85%	
Deaths in operating room	10	
Percentage of deaths under ether anesthesia in operating room to total deaths under ether anesthesia	7.3%	
	Spinal Series	Ether Series
Final Corrected Mortality Note: Ten patients, having had spinal anesthesia, died subsequent to secondary operations performed under nitrous oxide, ethylene, etc. With these eliminated the mortality stands	6.5%	6.85%

or that there were "no deaths for which the anesthetic could possibly be blamed"; or that, "in a series of one thousand cases there was but one death the result of the anesthetic." Almost invariably, because they fail to list all their deaths, they afford the reader no opportunity to draw his own conclusions. Such methods of case reporting are incomplete and, occasionally, misleading. This fact being recognized and also realizing that deaths occurring several days following the administration of an anesthetic may rightfully be attributed to an untoward action of it, we recorded every death occurring in the hospital, it being the only fair and unbiased way of arriving at a true appraisal of the relative safety of the two anesthetics under consideration (table 2).

In 1,875 cases, Sise [3] reported 4 deaths occurring on the operating table within one hour of the injection of a spinal anesthetic but called attention to the undeniable fact that sudden fatalities have occurred in many instances following the use of ether as well. Muller and Overholt [4] reported 2 sudden deaths soon after

TABLE 3.—*Ratio of Deaths Following Ether Anesthesia to Those Following Spinal Anesthesia* *

	Spinal	Ether
In operating room	1	10
Deaths in twelve hour periods for first three days postoperatively		
1st 12 hours	7	21
2d 12 hours	9	6
3d 12 hours	14	9
4th 12 hours	10	10
5th 12 hours	4	7
6th 12 hours	2	5
Total	46	58
At end of first five days	67	72
Deaths in five day periods		
1 to 5 days	67	72
6 to 10 days	26	28
11 to 15 days	15	13
16 to 20 days	7	11
21+ days	25	13
Total	140	137

* Two thousand operations under ether anesthesia; 2,000 operations under spinal anesthesia.

operation in 533 cases, 1 occurring on the operating table. In McKittrick, McClure and Sweet's [5] series of 338 patients, there were 40 deaths, a mortality of 11.8 per cent, 1 death only being attributed to spinal anesthesia; yet there were 6 unexplained sudden deaths all occurring in the first forty-eight hours. In none of these was the fall of blood pressure remarkable.

Undoubtedly, many deaths attributed to other causes have occured from the use of the anesthetic, but it is equally true that many deaths have been falsely attributed to spinal anesthesia, and in many of these cases postmortem examinations showed that conditions were present which would have caused the patient's death irrespective of the anesthetic used. We believe, however, with Bower and his associates [6] "that the death of a patient whose blood pressure drops more than 50 per cent or who develops respiratory embarrassment within twenty minutes following the injection and who does not react to within 25 per cent of the normal before the operation is finished and subsequently develops secondary shock and dies is an anesthetic death whether on the operating table or in the recovery room."

Not only must respiratory paralysis be guarded against, but when the anesthetic reaches the fifth or sixth thoracic nerves, especially if in a relatively high concentration, and particularly with patients with damaged myocardiums, death from two to six days following the operation may occur and may seem difficult to explain. We believe, however, that spinal anesthesia has been too frequently used in unskilled hands,

3. Sise, L. F.: Spinal Anesthesia for Abdominal Operations, New York State J. Med. **29**: 1182 (Oct. 1) 1929.
4. Muller, G. P., and Overholt, R. H.: Spinal Anesthesia, Ann. Surg. **94**: 738-750 (Oct.) 1931.
5. McKittrick, L. S.; McClure, W. L., and Sweet, R. H.: Spinal Anesthesia in Abdominal Surgery, Surg., Gynec. & Obst. **52**: 898-909 (April) 1931.
6. Bower, J. O.; Clark, J. H., and Burns, J. C.: Spinal Anesthesia, J. A. M. A. **100**: 245 (Jan. 28) 1933.

and that this fact accounts for most of the unfortunate results so often reported. However, in our studies, the mortality rate in our hospital was no greater with spinal anesthesia than with ether, deaths in the first, second, third, fourth and fifth day periods being considerably greater in number in the series in which ether anesthesia was used (table 3).

PERSONAL PREJUDICES

Surgeons have been too greatly influenced by strongly opinionated authors who, obviously prejudiced, have written either supporting or condemning the use of spinal anesthesia. A host of papers has appeared citing long and fortunate experiences with spinal anesthesia with no deaths "attributable to the anesthetic," a phrase leaving a justifiable doubt in the mind of the reader. Tendler[7] recently presented a tabulation embracing a large variety of technics and drugs and including a series of 6,000 cases of Rastich's with "no deaths"; one by McCormack of 5,000 cases with "no deaths"; one by Gosset and Mounod of 2,000 cases with "no deaths"; one by Bainbridge, a series of 1,065 cases with "no deaths," and one by Labat of 1,000 cases with "no deaths." By this we are led to believe that there were no deaths the authors were willing to attribute to the method; consequently, the personal equation and that psychologic phenomenon of "the will to believe" render such data of questionable worth.

TABLE 4.—*Deaths in Operating Room*

Patient	Age, Years	
Ten Patients Who Died in Operating Room under Ether Anesthesia (From a Total of 2,000 Consecutive Operations)		
1. Woman	35	Suturing traumatic rupture of the uterus; advanced peritonitis
2. Woman	29	Salpingo-oophorectomy; cardiorespiratory failure
3. Woman	66	Appendectomy; gangrenous appendicitis; cardiorespiratory failure; peritonitis
4. Man	60	Exploratory laparotomy (chronic cholecystitis and pancreatitis); chronic myocarditis; cardiac failure
5. Man	62	Closure—perforated duodenal ulcer; generalized peritonitis
6. Woman	26	Exploration—retroperitoneal sarcoma; cardiorespiratory failure
7. Man	36	Secondary, exploratory laparotomy; hemorrhage following gastro-enterostomy performed seventeen days previously
8. Woman	29	Salpingectomy—ectopic pregnancy; extensive preoperative hemorrhage
9. Man	60	Died of intestinal obstruction before incision could be made
10. Man	15	Open reduction and plating; fracture of the femur; cardiorespiratory failure
One Patient Who Died in Operating Room Following Spinal Anesthesia (From a Total of 2,000 Consecutive Operations)		
1. Woman	52	Supravaginal hysterectomy and salpingo-oophorectomy; patient died while fascia was being closed; had been given 150 mg. of procaine hydrochloride supplemented by nitrous oxide and ethylene; stimulants and artificial respiration administered with no effect; autopsy revealed: (1) miliary tuberculosis; (2) chronic myocarditis; (3) chronic cholecystitis; (4) fatty degeneration of the liver (5) chronic nephritis; (6) atheroma of the aorta; (7) active pulmonary tuberculosis; (8) active tuberculosis of the spleen.

Per contra, innumerable papers have appeared unalterably opposed to spinal anesthesia, many of their authors being, as was recently the case with a distinguished writer[8] who summarily condemned spinal anesthesia, surgeons who have never used it and whose knowledge is, therefore, entirely second hand. Obviously, such opinions are anything but authoritative and are as valueless as those cited in the preceding paragraph.

7. Tendler, M. J.: Spinal Anesthesia, Memphis M. J. **6:** 143-155 (July) 1929.
8. Bevan, A. D.: The Present Status of the Anesthesia Problem, J. A. M. A. **97:** 1530-1536 (Nov. 21) 1931.

DEATH IN THE OPERATING ROOM

While death in the operating room is referred to in many published reports as an accident to be occasionally, possibly frequently, expected when spinal anesthesia is employed, in our series of 2,000 operations performed under spinal anesthesia we witnessed it but once, yet saw it occur ten times with ether anesthesia (table 4). In other words, in this series of 4,000 operations, deaths on the operating table occurred 90 per cent less frequently when the patients were operated on under spinal anesthesia. We may add, all the inhalation anesthetics were administered by skilled anesthetists, and the deaths on the operating table in the ether series occurred during operations on desperately ill or injured patients, obviously exceedingly bad risks. There were, however, as many equally unpromising patients operated on under spinal anesthesia, with the marked decrease in mortality referred to previously, a strong argument, at least in our experience, for spinal anesthesia and for its use in certain cases in which the patient is a bad operative risk. Operations following which death occurred are listed in table 5, and the

TABLE 5.—*Operations in Which Death Occurred*

Operations	Ether	Spinal
Amputations	2	11
Appendectomies (generalized peritonitis)	23	17
Exploratory laparotomies (chiefly cancer)	35	22
Herniorrhaphies (all strangulated)	6	12
Operations on gallbladder and ducts	19	20
Operations on kidney, bladder and prostate	6	12
Operations on pelvis	11	15
Operations on stomach and intestines	32	30
Open reduction of fracture	1	1
One patient died before incision was made	1	..
Splenectomy	1	..
Total	137	140

TABLE 6.—*Spinal Anesthesia in Cases in Which Death Occurred*

Procaine Hydrochloride, Mg.	Cases
200	40
175	1
150	54
120	29
100	5
50	5
?	6
Total	140
Average dosage	153 mg.

TABLE 7.—*Cause of Death in 4,000 Operations* *

Diagnosis	Ether	Spinal
Abscess, liver	..	1
Atrophy of liver, acute yellow	1	..
Bronchopneumonia	11	13
Carcinomatosis	20	16
Cirrhosis of liver	1	3
Edema, pulmonary	1	..
Embolism, pulmonary	9	11
Hemorrhage	5	6
Mediastinitis	1	..
Myocarditis	19	24
Obstruction, intestinal	19	7
Pancreatitis	1	4
Peritonitis	40	42
Psychoses	2	..
Septicemia	3	5
Thrombosis, mesenteric	2	..
Uremia	2	8
Total	137	140
Autopsies	29	65
Autopsy percentage	21.2%	46.4%

* Two thousand performed with spinal anesthesia; 2,000 with ether anesthesia.

dosage of procaine hydrochloride in table 6. The cause of all deaths in the hospital both with spinal anesthesia and with ether is shown in table 7.

We are passing through a period of widespread lack of understanding regarding spinal anesthesia largely due to the lack of a standardized method and a perfected technic. Dill [9] recently inquired:

> What is the best drug to use? Novocaine, neocaine, spinocaine, tutocaine, nupercaine, stovaine, apothesine? Should the solution be heavy or light; ready made or extemporized with the patient's own spinal fluid? Should it be injected with much, little or no barbotage; slowly or rapidly? Should the patient sit up or lie down for the injection? Some carefully measure the spinal pressure; tilt the table according to the tiltometer; inject adrenalin, ephedrine or caffeine, before, during or after. Others care for none of these. Some claim that adrenalin and ephedrine are not only useless, but even harmful. Koster and Labat, to forestall cerebral anemia, insist upon the Trendelenburg position. Evans recommends raising the shoulders on two pillows to forestall diffusion cephalad. Most would not apply it to operations above the diaphragm; others apply it to the head, neck and thorax as well. How should we gauge the dose? Some say by body weight, others say by size of the spinal canal and the amount of spinal fluid, and estimate the amount by "experience." Is the height of analgesia controlled by volume of spinal fluid aspirated and reinjected, dose of drug, or injection time? May deny that there is any control.

Briefly, we would answer these questions by saying that procaine hydrochloride is the best drug to use. It should be dissolved in an ampule in the patient's spinal fluid, then injected slowly, with some barbotage, depending on the extensiveness of the anesthesia desired. The patient should be sitting up or lying on his side while the injection is being made, and placed in the horizontal position thereafter, or in the Trendelenburg position if the surgeon is to operate in the pelvis. The dose

TABLE 8.—*Dosage of Procaine Hydrochloride in 2,000 Operations Under Spinal Anesthesia*

Procaine Hydrochloride, Mg.	Cases
250	1
200	316
175	1
150	632
120	646
100	198
90	2
80	2
75	13
65	1
60	5
50	163
40	2
35	1
30	1
25	3
20	1
?	12
Total	2,000
Average dose	133.71 mg.

should range from 25 to 200 mg., but only occasionally the latter (table 8). Tilting the table a few degrees one way or the other is of no especial assistance. Epinephrine and ephedrine are helpful. Operations should be confined to structures below the diaphragm. We agree with Stout [10] and with McKittrick and his associates [5] that the level of anesthesia depends largely on the amount of fluid used to dissolve the crystals, and that the position of the patient, if fairly large dilutions are used, has but little to do with it. We also feel that, after the first few minutes, the level cannot be changed.

9. Dill, W. W.: Statistical and Other Observations on Spinal Anesthesia, Pennsylvania M. J. **35**: 244-246 (Jan.) 1932.
10. Stout, R. B.: Spinal Anesthesia, Volume Control Technic, Am. J. Surg. **7**: 57-66 (July) 1929.

No one will deny that spinal anesthesia greatly facilitates the work of the surgeon but, also, from the personal point of view of most patients, the method possesses distinct advantages, as is shown in table 9.

PULMONARY COMPLICATIONS

In every essay on spinal anesthesia the question of postoperative pulmonary complications invariably appears. Campbell [11] stated that such conditions are several times more frequent under inhalation anes-

TABLE 9.—*Replies to a Follow-Up Questionnaire Sent to 500 Consecutive Patients Given Spinal Anesthesia*

Have You Ever Had Ether?	
Yes	185
No	217
Gas	1
Question unanswered	3
Total	406
If You Were to be Operated on Again Would You Choose Spinal or Ether?	
Spinal	335
Ether	48
Questionable	23
Total	406

thesia, yet many have reported a greater incidence with spinal anesthesia. Our experience, as well as that of many writers, suggests an incidence about equal with the two forms, possibly even greater with spinal anesthesia, and this result coincides with that of McKittrick, McClure and Sweet who compared the pulmonary complications in two surgical series, one in which spinal anesthesia was used and the other inhalations.

It seems, therefore, that we cannot hope to reduce the incidence of postoperative pulmonary complications by using spinal anesthesia, however great some of its advantages in other directions may be. Many authors have reported a higher incidence of these conditions and, especially, postoperative pulmonary atelectasis, including Brown and Debenham,[12] Foss and Kupp,[13] and Muller and Overholt.[4] The inhibition of the force and depth of respirations with a resulting increased difficulty of ridding the bronchial tree of foreign matter or secretions probably accounts for this. In this series, however, there were 11 deaths from pneumonia in 137 deaths following ether and but 13 from pneumonia in 140 deaths following spinal anesthesia.

SPINAL ANESTHESIA IN ACUTE ABDOMINAL EMERGENCIES

With certain conditions it seemed that spinal anesthesia is definitely helpful in reducing the mortality rate. In our first 400 operations for acute appendicitis performed under spinal anesthesia, the mortality was exactly 33 per cent less than that in the preceding 400 operations performed under ether. The series may be too small to be significant, but as similar reductions invariably occurred in operations for perforated ulcer, for strangulated hernia and for acute intestinal obstruction, we were convinced that, at least with acute abdominal emergencies, the far greater ease and celerity with which the operation can be performed clearly exerts a positive influence in reducing the operative mortality.

11. Campbell, M. F.: Spinal Anesthesia in 1,520 Urological Operations, J. Urol. **24**: 279 (Sept.) 1930.
12. Brown, A. L., and Debenham, M. W.: Postoperative Pulmonary Complications: Study of Their Relative Incidence Following Inhalation Anesthesia and Spinal Anesthesia, J. A. M. A. **99**: 209 and 210 (July 16) 1932.
13. Foss, H. L., and Kupp, John: Respiratory Complications and the Surgical Patient, Surg., Gynec. & Obst. **51**: 798-804 (Dec.) 1930

EFFECTS ON THE SPINAL CORD AND MENINGES

Since surgeons first began using spinal anesthesia there have been speculations as to the effect of the drugs used on the spinal cord and meninges. Spielmeyer,[14] in 1908, produced, experimentally, peripheral degeneration of the myelin in the lateral, anterior and posterior columns of the spinal cord without changes in the nerve roots or nerve cells. Lundy recently produced the same change by using huge doses of procaine hydrochloride. Transient lesions of the spinal cord have been reported by Davis, Haven, Givens and Emmett.[15]

In the 2,000 cases studied by us and in nearly 1,000 injections made since the material for this paper was gathered, we have never seen the slightest evidence of peripheral neuritis or sensory or motor disturbances. We have never seen a case of foot drop or have had patients who suffered from pain in the body or in the legs following spinal anesthesia.

Lundy, in a personal communication, stated that at the Mayo Clinic they have never noticed that sterile procaine hydrochloride, administered by the usual technic and in safe doses, has produced any serious changes in the spinal cord.

CONCLUSIONS

1. Mortality figures, based on all deaths in the hospital following 4,000 consecutive major operations, one half performed under spinal anesthesia and one half under ether, have been studied.

2. Deaths in the operating room, as has frequently been alleged, are by no means more frequent with spinal anesthesia than with ether. In fact, in this series, they were far commoner with ether, in a proportion of 10: 1.

3. Postoperative deaths occurring in the first few days following operation are not, as is frequently claimed, more common after spinal anesthesia. In this study the reverse was true, ether carrying a much higher mortality rate.

4. The ultimate death rate in the hospital is practically the same following the administration of the two anesthetics. In this series of 4,000 closely parallel operations the difference was only 0.15 per cent.

5. While pulmonary complications are no less common following spinal anesthesia, there is not a noteworthy increase in the incidence of pulmonary deaths when this anesthetic is used over those occurring following the administration of ether. In this series the number of deaths due to postoperative pulmonary complications was practically equal with the two methods.

6. Spinal anesthesia can be used more or less as a routine measure in operations below the diaphragm with far greater relative safety than most surgeons at present seem to believe. It is the anesthetic, *par excellence,* in most acute abdominal emergencies, acute appendicitis, intestinal obstruction and perforated ulcer.

7. A large number of papers have been written opposed to, or in support of, spinal anesthesia and contain conclusions which are based on unsupported opinions rather than on a thorough, comparative analysis of hospital morbidity and mortality and, therefore, are not only far from being helpful but have been, frequently, misleading.

8. There is some evidence to suggest that certain changes in the spinal cord may follow the injection of procaine hydrochloride into the subarachnoid space, but we are yet to learn whether or not this is common, is permanent or is of any especial significance, provided an aseptic and proper technic is observed.

9. Improvements in technic have rendered the use of spinal anesthesia as safe as the use of ether anesthesia, and, in most instances, it is infinitely more convenient and helpful and followed by fewer complications.

10. The majority of patients prefer spinal anesthesia, this being especially true with those who have had both spinal and ether anesthesia.

11. Nothing in this study has suggested that postoperative complications of any importance, either early or remote, are any more frequent following spinal anesthesia than following any form of inhalation anesthesia. We agree with Pemberton,[2] who said: "I have never seen a serious complication as the result of the administration of spinal anesthesia as used in the Mayo Clinic."

12. No anesthetic is without certain inherent dangers, but merely because spinal anesthesia is a new anesthetic method, one should not be too appalled when an unexpected and untoward result occurs following its employment and be too unreasonable in condemnation of the method, at least until a careful review is made of the results obtained with ether, the occasional, yet inevitable, complications associated with which have, through long familiarity, been too largely disregarded.

14. Spielmeyer, W.: Veränderungen des Nervensystems nach Stovainanästhesie, München. med. Wchnschr. **55**: 1629-1634 (Aug. 4) 1908; Pseudosystemerkrankungen des Ruchkenmarkes nach Stovainanästhesie, Neurol. Centralbl. **28**: 69-80, 1909.

15. Davis, Loyal; Haven, Hale; Givens, J. H., and Emmett, John: Effects of Spinal Anesthetics on the Spinal Cord and Its Membranes: An Experimental Study, J. A. M. A. **97**: 1781-1785 (Dec. 12) 1931.

ABSTRACT OF DISCUSSION

DR. JOHN S. LUNDY, Rochester, Minn.: It does not seem to me that these results can be entirely related to the anesthetic agent or to the method of its administration. The authors have stated that many of these patients were moribund when they were brought to the operating room. In that case I doubt whether I would have chosen either the drop method or spinal anesthesia. I do not know just what the arrangement of the authors is for supervision of the department of anesthesia, but I find that, if anesthesia by ether is to be satisfactory in a large group of cases, it will be necessary to provide an artificial airway for some patients. Magill's large-bore, smooth, soft rubber intratracheal catheter is very useful. In a few cases it will be necessary to aspirate material from the trachea before the patient leaves the operating room. If all the facilities are not available for caring for the occasional patient who does not take well an anesthetic such as ether, the morbidity rate will be increased over that of the group of patients who have available to them all the facilities for making anesthesia smooth. If the morbidity is increased, the probability is that mortality will be increased, for the group in which there is morbidity includes all who die, and there is a rather high percentage of deaths in cases in which grave postoperative complications develop. Therefore it will be necessary to provide means for avoiding postoperative complications in order to reduce the mortality rate. The paper is an eloquent plea for the use of modern methods and agents in anesthesia. I believe that spinal anesthesia, ether anesthesia, or any other anesthetic agent or method should not be used as a routine. Anesthetists now have a large choice of agents and methods. The patient should have that agent and method carefully selected so that as many as possible of the postoperative complications may be avoided which will probably develop if a routine method has been adopted.

DR. GEORGE W. CRILE, Cleveland: The authors have presented an admirable analysis of the problem of anesthesia and have made clear that accurate data and sound thinking are required to reach safe conclusions. I recall a front line hospital in France in 1917 where, in the same operating theater, ether anesthesia, nitrous oxide anesthesia and spinal anesthesia were used. The contrasts in the mortality from amputations of the thigh performed with these different anesthesia methods

were clear cut and striking. Of a hundred soldiers subjected to amputation of the thigh, performed under ether anesthesia, sixty-six died and thirty-four lived. Under spinal anesthesia, approximately twenty died and eighty lived. Under nitrous oxide, approximately twenty died and eighty lived. Dr. T. E. Jones of the Cleveland Clinic, in his personal experience in ninety-eight cases of one-stage abdominoperineal resections for cancer, reports that under spinal anesthesia the mortality rate was 12 per cent, in contrast to more than twice that mortality rate under ether anesthesia. Miss Hodgins and her group at Lakeside Hospital and Miss Adams and her group at the Cleveland Clinic Hospital have administered 112,000 gas-oxygen anesthesias to white patients with only three anesthetic deaths, or a mortality rate of 1 to 37,000. This series includes straight nitrous oxide anesthesia, nitrous oxide with local and regional anesthesia, and nitrous oxide and ether combined. Such a series presupposes a high order of training on the part of the anesthetists. In this series all the anesthetics were administered by highly trained nurse anesthetists. A small, separate series of Negro patients, however, shows four deaths, the obvious conclusion being that only the most experienced and the most skilled anesthetists should administer nitrous oxide to a Negro patient. The principle is established that nerve blocking involves every type of block anesthesia from mere local anesthesia to spinal anesthesia, as the only complete protection against shock. Gas-oxygen anesthesia, for a still unknown chemical reason, is equally a protection against shock. In many abdominal operations, gas-oxygen anesthesia fails to give the necessary relaxation; therefore, ethylene, ether or spinal anesthesia is used. Spinal anesthesia carrying the highest anesthetic mortality should not be used in trivial or minor operations or in operations that have no shock mortality: on the other hand, as a rule, inhalation anesthesia should not be used in the major shock-producing operations. When shock per se is the paramount risk, spinal anesthesia should be used; when the anesthesia per se is the remaining risk, spinal anesthesia should be avoided.

THE PRESENT STATUS OF ETHYLENE

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March 12, 1933,[1] marked the tenth anniversary of the introduction of ethylene in the anesthetic field, and it seems a fitting time to discuss its merits, demerits, and general application in surgery.

In order to determine the present status of this agent, a questionnaire was sent to the leading anesthetists of the United States, Canada and foreign countries. The questionnaires were sent to anesthetists rather than to surgeons because it was thought that the attitude of the surgeon would be reflected in the answers of the anesthetists, as well as their own opinion. This supposition proved to be correct. An opinion based on this survey seems justifiable. One thousand questionnaires were sent out. A few were returned because of deaths or improper addresses. Five hundred and thirty-four replies were received. Two hundred and twenty were using ethylene and 314 were not using it. Ethylene was administered alone 737,815 times and combined with ether for varying periods 267,560 times, making the total of recorded ethylene anesthesia 1,005,375. Many anesthetists who were unable to give the number of ethylene anesthesias they had administered, because records were not kept, stated that several thousand, or from 70 to 80 per cent of all anesthesias, were with ethylene.

There were no explosions or deaths recorded by this group.

The various odors of ethylene are due to impurities and the administration of such ethylene may be accompanied by nausea, gagging, vomiting and more or less cyanosis. Impure ethylene usually produces an accumulation of yellow oily material in the machine connections. Since these objectionable features have been nearly eliminated by the reliable expert manufacturers, it is a rare occasion to have a patient refer to or object to the odor.

Ethylene is not unpleasant to inhale if it is administered slowly, with a liberal amount of oxygen during induction of the anesthesia.

The administration of nitrous oxide before ethylene is not practiced in the Presbyterian Hospital of Chicago because, as stated before, pure ethylene is not unpleasant if properly given and because of the feeling that a combination of the two gases on the same machine and in a patient's lungs may not be safe. So strong is this belief that we have separate gas machines for ethylene and for nitrous oxide; in other words, tanks of the two gases are never on the same carriage. The decision is made before operating as to which gas is to be used, and then its administration is continued throughout the operation unless a change to ether becomes desirable.

After an extensive experience with local analgesia, chloroform ether and nitrous oxide-oxygen, I feel that ethylene possesses distinct advantages over all other anesthetics, especially when combined with local infiltration in pelvic and upper abdominal operations.

One of the many advantages of any gas anesthesia is the early awakening with little or no vomiting and the ability to clear the throat of mucus, and the trachea and bronchi of aspirated stomach contents, pus from lung abscess or material following jaw, mouth and throat operations. Gas is not irritating to lung epithelium and consequently can be given when anesthesia becomes necessary following pneumonia or any acute respiratory infection. At present the two gases, nitrous oxide and ethylene, are available and quite naturally a decision must be arrived at as to their relative safety and efficiency if the advantages of each are to be taken into account. When ether is combined with nitrous oxide-oxygen, the explosive hazard is fully as great as it is with ethylene-oxygen. Further, ethylene has the advantage over nitrous oxide in that it produces greater relaxation, and better oxygenation can be maintained throughout long and difficult operations.

Cyanosis is distressing to both surgeon and anesthetist, especially when they are accustomed to the appearance of normal oxygenated blood.

The immediate safety of a gas anesthesia is due to the percentage of oxygen that can be administered with it. This consideration is an important one, as abundant research has shown. It is now quite generally agreed that blood changes depend on the amount of oxygen in the circulating blood; and as cyanosis does not develop in a properly administered ethylene anesthesia, it is quite clear that blood changes are practically absent. The results of the early studies of Luckhardt and his co-workers, relative to blood changes under ethylene anesthesia, have been repeatedly confirmed by other investigators. Brumbaugh[2] found "no changes in hemoglobin, no appreciable change in the icterus index; blood sugar is increased but quickly returns to the preanesthetic level. There was no increase in blood urea

Read before the Section on Miscellaneous Topics, Sessions on Anesthesia, at the Eighty-Fourth Annual Session of the American Medical Association, Milwaukee, June 15, 1933.

1. Herb: Ethylene: Notes Taken from the Clinical Records, Anesth. & Analg., December, 1923.

2. Brumbaugh, J. D.: Effects of Ethylene-Oxygen Anesthesia on the Normal Human Being, J. A. M. A. **91:** 462 (Aug. 18) 1928.

immediately following ethylene anesthesia and but a slight increase in twenty-four hours. A moderate temporary decrease of the carbon dioxide combining power of the blood. No change in coagulation time. No change in the character of the clot." Trout,[3] from his researches, concluded that "ethylene-oxygen produces less alteration of the percentages of blood sugar, the coagulation time or the bleeding time than any other of the commonly employed anesthetics."

Ether is the only general anesthetic agent known at the present time that will produce complete relaxation in all types of surgical conditions. However, its use has been greatly reduced since the advent of ethylene. In abdominal operations, in which complete relaxation is required, a combination of ethylene and ether may be given which usually produces the desired relaxation. This failing, all ether may be resorted to and continued till the peritoneum has been sutured, when a return to ethylene for the remainder of the closure may be practiced, thus considerably shortening the ether anesthesia.

Active intestinal peristalsis may occasionally interfere with the operative technic and the administration of ether becomes desirable, as ethylene does not stop peristalsis.

Operations requiring vapor anesthesia, and abdominal operations, are practically the only ones in which straight ether is administered in the Presbyterian Hospital. The number of abdominal operations in which straight ether has been given has been greatly reduced since the introduction of local anesthesia in combination with ethylene-oxygen. The best results with local anesthesia have been obtained by nerve blocking. The entire abdominal wall and peritoneum may be rendered anesthetic by a simplified bilateral blocking of the intercostal and lumbar nerves. When the nerve blocking has not been complete, peritoneal infiltration after the abdomen is opened will greatly aid the anesthesia.

When a deeper anesthesia is required than can be safely obtained by local anesthesia and ethylene, ether may be combined with the ethylene for short periods of time, either during the early stages of the operation or sometime during the anesthesia. This small amount of ether, apparently, does not affect the awakening period and has no ether after-effect.

The most common reason given in answers to the questionnaire for not using ethylene was the fear of explosion. This fear was held by the surgeon, the anesthetist or the hospital superintendent. Doubtless, the wide publicity given the early mishaps is responsible for this widespread fear. In some instances, particularly in the Far West, fire insurance rates were so increased that the use of ethylene had to be abandoned.

The most enthusiastic users of ethylene were those who reported many thousand anesthesias; conversely, those who were most positive that it had no advantage over nitrous oxide had had little or no experience with its use. There is almost a unanimous feeling among dentists that nitrous oxide is preferable to ethylene in their office work, because of the fear of explosions, because nitrous oxide oxygen is pleasant to inhale, because relaxation is not necessary and because the anesthesias are of short duration. Oral surgeons who use ethylene praised it especially for jaw operations and impacted teeth.

Two of the reasons given by several correspondents were "the Cleveland disaster" and "the Evansville explosion." As a matter of fact, neither of these most unfortunate happenings was due to ethylene. The Cleveland explosion was due to fire in the storage plant of x-ray films in a building apart from the operating department. The Evansville explosion occurred during the repair or manipulation of a tank of nitrous oxide, which it was thought might possibly have contained some ethylene from a backflow during an operation. The latter is a supposition without any proof and shows the prejudice toward ethylene or a general lack of knowledge that nitrous oxide-oxygen-ether is explosive. The greater number of explosions with nitrous oxide-oxygen-ether during or after anesthesia when the machine was idle, as recorded in answers to the questionnaire, shows definitely the explosiveness of this mixture. After a careful study made in the Evansville case, I have concluded that static electricity played a very important part in this sad fatal explosion.

The undue publicity given the explosive hazard of ethylene was unfortunate, because it has deprived patients, surgeons and anesthetists of a most valuable anesthetic agent. The answers to my questionnaire regarding nitrous oxide-oxygen-ether explosions were quite unexpected, because of the much greater number than had occured with ethylene over the same period of time. It is regrettable that I did not include the number of nitrous oxide-oxygen-ether anesthesias in the questionnaire, because that would have given an opportunity for comparison.

The number of ethylene and nitrous oxide-oxygen-ether fatalities has not been large, considering the hundreds of thousands of anesthesias. However, a great deal may be done to diminish the hazard further. Many who are using ethylene and nitrous oxide-oxygen-ether are living in a sense of false security because of the inefficiency of their methods for static control or the lack of knowledge of the explosive nature of nitrous oxide-oxygen-ether.

An exhaustive study was made by Cheney and Folkman[4] to determine the concentration of ethylene in the air of the operating room. Their observations are instructive and of practical value. Using a device developed by the Union Carbide Company for the detection of methane and other inflammable gases in coal mines, they were able to determine the actual percentages of ethylene in the air at any particular point desired during the course of the anesthesia. The instrument determines percentages of a combustible gas, up to and including the lower limit of inflammability. In the case of ethylene, the lower limit of inflammability is 3.02 per cent; that of ether is 1.71 per cent with air. At a distance of 10 feet or more from the patient's head, the concentration of ethylene was so small as to be indeterminable and after numerous tests in the area 6 feet or more from the head of the table the readings were confined to the territory within that radius.

GENERAL SUMMARY

1. No evidence of accumulation of building up of ethylene percentages in any portion of the operating rooms was shown after the longest period of anesthesia.

2. Electric switches (or similar apparatus) on the walls of the operating rooms were shown to be entirely harmless, as the maximum ethylene concentration at these points showed less than 0.1 per cent. It should be kept in mind that the minimum percentage of ethylene in air that is flammable is 3.02 per cent.

3. Trout, H. H.: Blood Changes Under Ethylene, Anesth. & Analg. 8: 269 (Sept.-Oct.) 1929.

4. Cheney, M. B., and Folkman, M. L.: Anesth. & Analg. 9: 11 (Jan.-Feb.) 1930.

3. The tests demonstrate the very rapid "rate of diffusion" of ethylene in air, which, obviously, is the basic reason for the low concentration found.

4. The tests showed that the only points when explosive mixtures of ethylene and air occurred were in the immediate vicinity of the face mask. The "dangerous area" may be described as one foot above the mask and two feet to the side of the exhalation valve. All the tests were made in hospitals of modern construction with no unusual ventilating systems.

CONCLUSIONS

The danger zone so far as flammable mixtures of ethylene and air are concerned is confined to an area within a few feet of the exhaling valve of the face mask. Furthermore, the direction in which the exhalation of the patient is pointed, in case the face mask is equipped with an adjustable vent, is an important factor.

INFLAMMATION OF ETHYLENE-OXYGEN

Tests were made by the Bureau of Mines to determine the limits of inflammability of ethylene-oxygen mixture. It was found that the ethylene content must be 80 per cent or higher; or, in turn, the oxygen content must be higher than 20 per cent. Nine volumes or more of carbon dioxide per volume of ethylene was found necessary to render ethylene noninflammable, and in a similar way it required 13.3 volumes or more of nitrogen per volume of ethylene. In view of the large amount of either of these gases required it is not feasible to use this method in practice as has been suggested, because the oxygen content would be so reduced that the patient's life would be in jeopardy.

METHODS OF INSURING SAFETY

Safety in the use of ethylene-oxygen and nitrous oxide-oxygen-ether mixtures must be accomplished by removing sources of ignition such as open flames, gas burners, stove fires, alcohol lamps, lighted candles, the striking of matches, cauteries near the point of administration, smoking near the gas machine, fulgurating machines with an open spark gap, and x-ray rooms.

That there is any advantage in passing ethylene over or through water to prevent explosions is open to question. In order to prevent freezing of the valves, the compressed gas is made very dry and will not be saturated by passing through water unless the water is kept warm or the gas is broken into very small bubbles.

From my own experience and the experience of other anesthetists, the conclusion has been reached that it is the static from without and not from within the machine that is to be feared. Several of the reported explosions occurred sometime after the close of the operation, when the machine had been "idle" for from a few minutes to two or more hours. The explanation of such accidents is simple. The machine had accumulated static on its external surface in sufficient amount to cause a spark when contact was made. If the charge on the machine is discharged through grounding, such accidents will not occur. During cold dry weather the air is full of static electricity and any moving body accumulates a sufficient amount to produce a spark, as is evidenced by a shock when one touches an electric light button or lights a gas jet after scuffing along on a rug. It is a mistake to believe that the flow of gas creates static, although the explosion may occur at the point of exit of the gas because of a spark at that point. Two of the explosions (one ethylene and one nitrous oxide-oxygen-ether) in our hospital were caused by friction, one on the outside of the breathing tube and the other on the outside of the bag some distance from where the gas was being delivered to the patient.

A relative humidity of 60 per cent will render surfaces conductive and prevent an accumulation of static. Doubtless, certain climates are so humid that static electricity is discharged and there is little or no danger of an explosion from this source; consequently, no precautions need be taken. If the humidity could be kept high enough in the operating rooms, it might be difficult to develop electrostatic charges, and any charge brought in from the outside would leak off. The drawbacks to a high humidity plan are, first, that the humidifying system would need constant watching and a drop in humidity might pass unnoticed and prove disastrous; second, that a high humidity, at the temperature maintained in the operating room, would render working conditions very uncomfortable. In considering the prevention of explosions, it was felt that a system was desirable which would not require constant supervision, and which, at the same time, would cause no discomfort to those concerned.

Our plan of preventing electrostatic explosions was that of having all objects on which a charge might exist connected together by a metallic connection and held at a standard potential, such as ground.

Because of the fact that charges might be brought in from outside, as well as developed by walking across the floor of the operating room, the conclusion was reached that a positive grounding system was needed: a system that would always give a dependable ground, that would ground any person or apparatus brought up to the operating table or gas machine, and that would not require constant watchful supervision.

It was decided that the best plan at the time would be the installation of a sheet of steel on the floor, large enough to accommodate surgeons, anesthetists, nurses, the operating table and the gas machine. The sheet was installed and is of such a size that any person approaching the gas machine or operating table will first be grounded by stepping on the outer margin of the metal plate. Later, the following floor plan was devised and was installed: The floors and base are what is commonly known as cloisonné terrazzo, similar to the kind of floors used in some of the large rooms in modern hotels. Briefly, it consists of small squares of terrazzo, separated by narrow brass strips. For our purposes these strips are placed 5 inches on centers each way and are slotted together at the intersections. After the terrazzo material hardened, the entire surface was ground down to a smooth finish, which brings the edges of the strips flush with the floor. The general appearance is that of a tile floor, except that the joints are brass instead of cement. This grille of brass strips is electrically connected together and then grounded to the water pipes. Each piece of movable equipment, such as tables, stands and anesthetizing machines, is equipped on the under side with several small link brass chains, which are long enough to drag on the floor for several inches.

Regardless of the position of the equipment on the floor, at least one of these chains is in contact with a brass strip; thus all are grounded and a difference in potential is impossible. The smallness of the squares of terrazzo also grounds the operators and assistants, as they move about in their regular routine of work, which eliminates the possibility of an assistant going to another room or ungrounded equipment and bringing back a charge of differential potential.

The points of the system that was devised to prevent static may be thus summarized:

1. The terrazzo-brass floor that has been described or a grounded metal plate of nonrusting furniture steel, large enough to accommodate the operating table, the staff and the gas machine, with an unused margin on all sides, has been installed in the operating rooms.

2. The netting covering the breathing tube and bags is made of tinsel cord, which is connected to the metal frame of the machine.

3. Pendent brass chains, two or more in each case, are fastened to the axles of the operating table and the gas machine to ground them to the metal floor or the terrazzo floor.

4. A chain is used with a small metal plate on one end, which is placed under the patient to ground him to the table. The other end is thrown over the shield at the patient's head and down to the grounded table.

Experiments, and the administration of more than 20,000 anesthesias (since its installation) without the slightest indication of an explosion, confirm the belief that this system of grounding and of electrical interconnection will prevent electrostatic sparks.

While it may seem that the matter of connections has been entered into with considerable detail and that fine points have been followed to the extreme, it was felt that, to be on the side of absolute prevention and protection, a conclusion should be reached on every point that could possibly be foreseen.

Electric fans of the alternating current type have no brushes; consequently there is no sparking unless the fan is out of order. Such fans may be used in the operating rooms with safety. If operating rooms are small and the point of administration is within a few feet of the electric light switch, it is good protection to have mercury switches, which do not produce a spark when turned on and off, or have the switches outside the operating room.

In passing, I may state that those who have questioned our method for the control of static electricity are not familiar with its completeness, its simplicity, and the small expense connected with its installation. That it is efficient there can be no doubt, when one considers the many thousand anesthesias that we have given since the grounding was put in, without the slightest indication of an explosion, although the administrations were under exactly the same conditions that obtained during the first few hundred anesthetics (administered before grounding), when several explosions occurred with both ethylene and nitrous oxide-oxygen-ether.

The question as to the cost of ethylene must be a relative one, because the administrator, character of the operation, the amount of rebreathing practiced, and the type of gas machine all play their part in the amount used. All things being about equal and taking the record of four anesthetists in a like number of different hospitals, and averaging them, we found the cost to be about $1.60 an hour. The original cost of ethylene quite naturally must vary. Hospitals using a large amount would be able to purchase it more cheaply than those using a small amount.

It has been said that ether explosions and fires would number at least a hundred a year. Is it because they are so common that little publicity is given them?

The deaths from explosions during oxygen-ether anesthesia lead to the belief that the mixture of pure oxygen and ether form a more highly combustible agent than does ether and atmospheric air. It is not generally known that a gallon of ether, under proper air conditions, has the explosive power of 75 pounds of dynamite. While the questionnaire did not include ether accidents, many volunteered such information.

Because of the general knowledge of the fire hazard of ether, certain precautions are generally observed. When an accident occurs, it is due to carelessness or caused by a badly constructed vaporizing machine. No one would think of discarding ether because of the possible accidents it might be responsible for. Then why abandon such a valuable agent as ethylene when its hazards can as surely be controlled?

Summing up the reported explosions, injuries and deaths, I find the following:

Ethylene, twenty explosions, with one injury and five deaths.

Mixture of nitrous oxide-oxygen and ethylene, two deaths.

Nitrous oxide-oxygen-ether, thirty-nine explosions with seven injuries and five deaths.

Nine explosions occurred when the machines had been idle from a few minutes to two or more hours. The machines had been used for ethylene administration in two instances and for nitrous oxide-oxygen-ether in seven of these explosions.

From the foregoing it is evident that nitrous oxide-oxygen-ether forms as highly an explosive mixture as does ethylene, and precautions against this danger are fully as urgent as is required with ethylene-oxygen.

Some of the injuries that occurred both with ethylene and with nitrous oxide-oxygen-ether were due to the ignition of the ether in the glass ether chamber of the gas apparatus. The breaking of this chamber scattered the glass and ether about the room, causing fires and burns.

Two deaths were recorded due to impure ethylene (carbon monoxide), two in the hands of "inexperienced administrators," and one due to "vasodilatation."

It appears to me that the last named death should be charged to operative conditions, such as hemorrhage, as ethylene does not produce or contribute to shock. If it destroys life, it does so through insufficient administration of oxygen, which would be asphyxia.

ABSTRACT OF DISCUSSION

DR. ARTHUR DEAN BEVAN, Chicago: In the subject of anesthesia, a joint laboratory and clinical research is the most scientific method of study. Ethylene was introduced in the surgical clinic of the Presbyterian Hospital in 1923. We used it about 2,500 times and during that period had a number of explosions. Fortunately, nobody was hurt. The rubber tubing at the mask was blown out, but it so disconcerted us that we gave it up. I ordered ethylene out of the hospital until the whole situation had been carefully analyzed. We found that the explosions were due to the static spark and that to eliminate the static spark it was necessary to ground the entire operating group. That could be done by placing the entire operating team and plant on a steel mat wired to the plumbing. This is described in my article on anesthesia in THE JOURNAL, Nov. 21, 1931, page 1530. We began the use of ethylene again and have used it in 27,000 cases without an anesthetic death and without an explosion. Ethylene has a wide place in modern anesthesia. I think Dr. Luckhardt and Dr. Herb have made the greatest contribution to anesthesia that has been made in the last twenty years. From my experience in clinical research on anesthesia, I think a most unfortunate situation has arisen in this country, especially in the hands of men of limited experience and men who lack judicial minds. Too many dangerous agents are being used. Among the most dangerous I would name first spinal anesthesia. There is no doubt that

spinal anesthesia has a higher mortality than chloroform. I think the time has come when either spinal anesthesia should be eliminated or its use should be restricted to a very narrow field. There are several other methods of anesthesia that should be used with the greatest possible caution. I refer to intravenous anesthesia and to intrarectal anesthesia. These methods are beyond one's control, once they are administered. The safest, the simplest and the most easily controlled methods of anesthesia must be selected. Today the entire field of anesthesia can be covered in the safest and most satisfactory way with the use of three agents: local—including blocking—ethylene and ether. If preanesthetic agents are employed, the safest is the combination of morphine and atropine in moderate doses.

FOUR FATAL CASES OF UNSUSPECTED AMEBIASIS

PRELIMINARY REPORT ON ONE ASPECT OF THE RECENT CHICAGO EPIDEMIC

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Following a meeting of about 125 members of the lumber trade who were drawing up a preliminary draft of a code for their industry, there occurred numerous cases of acute colitis and at least five deaths. The meeting was held in Chicago from June 30 to July 2, 1933. In all cases the symptoms began after the meeting was over and when the men were scattered all over the United States and Canada. We became interested in the situation not because of experience with these or other cases of amebic dysentery but because of close friendship and relationship, respectively, to two of the men who died.

The investigation of this situation is far from complete, owing to difficulties in securing rapidly information from many widely scattered localities. This preliminary report is made, however, because it has been found that these cases are a part of a much larger epidemic and because the diagnosis was not sufficiently suspected when the cases turned up sporadically at widely separated points. This criticism is made in all due humility and applies to the present authors themselves, who have no illusions that they would have handled the cases any better than they were handled. In fact, the senior author was consulted by the physician and family of patient 1, and never once (during the life of the patient), thought seriously of amebiasis as the diagnosis, having been trained to think of amebiasis only as a disease found for the most part in the tropics. In view of the fact that THE JOURNAL has contained several excellent articles on amebiasis by Craig [1] and others in the last two years, this shows how difficult it is to teach subjects that are not commonly seen and appreciated.

The epidemic (which was mentioned in the newspapers of the country, November 10) has been placed under control by the department of health of Chicago under the leadership of Dr. Herman N. Bundesen. A preliminary report on the epidemiologic aspects of the situation was presented by Tonney, Hoeft and Spector [2] before the American Public Health Association at its meeting, October 9. At the time of this report, Tonney and his co-workers were not aware of the cases presented here. The source was a group of carriers working in the kitchen of a Chicago hotel. The five fatalities among members of the lumber trade all occurred in guests at this hotel.

REPORT OF CASES

CASE 1.—*History.*—W. B., a man, aged 43, president of a Boston lumber company, had always been well save for occasional attacks of abdominal pain, attributed by him to mild appendicitis. He had been on a Mediterranean cruise in February, 1933. July 12, the patient suffered an acute attack of epigastric pain with immediate nausea followed by vomiting twelve hours later. He was then admitted to a hospital in New York. There was suprapubic tenderness, and pain on the right side by rectum, but no spasm or tenderness by direct palpation over McBurney's point; there was absence of diarrhea or bloody stools. The white blood count was 18,000 with 90 per cent polymorphonuclears. The temperature was 99.6 F. The urine was normal.

July 13, laparotomy was performed with a preoperative diagnosis of appendicitis. A slightly inflamed appendix and ulcer of the cecum were found; the appendix and cecal ulcer were removed and the wound was closed without drainage.

The pathologic examination revealed that the appendix measured 6 by 5 cm. The serosa was pink and rather granular, and there was a diffuse vessel injection. The lumen had been opened at the proximal two thirds. Cross-section of the distal third showed the lumen apparently obliterated by fibrous tissue. The mucous membrane of the medial two thirds was rough and covered with bloody fluid. Sections were taken from each area. There was also a circular piece of tissue, 4 cm. in diameter, with a wall 0.7 cm. thick and a concavity of one surface. The outer surface was thick around the periphery but with a center which was gray with some necrotic material. The inner surface was somewhat corrugated and was gray around the periphery and red in the center, but there was friable necrotic tissue in the center.

Microscopic examination disclosed many scattered leukocytes in the wall of the appendix. There was no abscess formation nor necrosis. The wall of the cecum showed a large zone of ulceration with hemorrhage and masses of polymorphonuclears. There was intense engorgement of the vessels, some of which showed fibrin and leukocytes in the lumen. Many phagocytes were seen with red cell inclusions.

The pathologic diagnosis was acute gangrenous ulceration of the cecal wall; acute appendicitis.

The next day the patient began to have for the first time severe diarrhea, which gradually became very much worse. Believing that an abscess had developed, surgeons again explored the right lower quadrant five days later and found an almost gangrenous cecum and inflamed ascending colon. The wound was closed after insertion of a soft rubber wick. Two days later a fecal fistula developed, followed in ten days by generalized peritonitis. The patient died, August 4.

Many examinations of stools were made from July 19 to July 26 for typhoid bacilli and Endamoeba histolytica. These were negative. Blood agglutination tests for typhoid and bacillary dysentery were also negative.

Autopsy.—The entire large bowel was ulcerated; the cecum and ascending colon were gangrenous and there appeared to be only a small zone near the rectal end which still preserved a little mucosa. The liver showed no lesions, and observations otherwise were not remarkable. Microscopic examination of the ulcers of the bowel revealed Endamoeba histolytica.

CASE 2.—*History.*—A. M., a man, aged 64, president of a Toronto lumber company, whose past history was unimportant, had been in Japan in 1929 but had not been ill during or after this trip. About July 28 he began to feel tired and feverish and to have a headache. There were no abdominal symptoms at all. The temperature was 102 and the white count 8,000. This condition continued for two weeks, when he began to have diarrhea of from three to four movements a day. Three days later (August 14) he had a sudden severe pain in the abdomen and right shoulder. On examination he presented the

1. Craig, C. F.: The Amebiasis Problem, J. A. M. A. **98**: 1615-1620 (May 7) 1932; The Symptomatology of Infection with Endamoeba Histolytica in Carriers, ibid. **88**: 19 (Jan. 1) 1927.

2. Tonney, F. O.; Hoeft, G. L., and Spector, Bertha Kaplan: The Threat of Amebiasis in the Food Handler, J. A. M. A. **101**: 1638 (Nov. 18) 1933.

appearance of shock, with marked spasm of the entire abdomen and tenderness in the right lower quadrant. Two days after this attack he was moved to a Toronto hospital, the tenderness in the right lower quadrant persisting. A barium enema showed moth-eaten irregularities of the cecum and ascending colon. The white count was 25,000. August 19, an abscess in the right lower quadrant was drained. August 24, a right subphrenic abscess was drained. The patient died, August 26.

Autopsy.—The abdomen showed much necrotic intestine and advanced generalized peritonitis. The large intestine was too gangrenous from the cecum to the transverse colon to show definite mucosal lesions; distal to the hepatic flexure the bowel showed multiple acute ulcers, with "slightly raised margins formed of swollen mucosa" and dark brown, "shreddy" necrotic centers. The appendix was distended at its distal portion. The small intestine had several areas of superficial ulceration, apparently related to a preceding adjacent and severe peritonitis. The liver weighed 2,150 Gm. and showed in the right lobe a large abscess, honeycombed and ragged in appearance. Microscopic examination of rectal ulcers and the appendix showed invasion by Endamoeba histolytica, with accompanying cellular infiltration. The liver sections merely showed chronic suppurative inflammation without specific characteristics.

CASE 3.—*History.*—M. E. R., a man, aged 67, president of a Seattle lumber company, gave a vague history of occasional attacks of diarrhea for the past three years. Acute diarrhea began, July 15, Three days later, proctoscopy showed ulcers of the upper part of the rectum. He went against advice from Seattle to Washington, D. C., and on his return, August 1, the diarrhea was worse. Proctoscopy was again performed and he was sent to a hospital in Seattle. At first, physical examination was essentially negative, except for the obvious appearance of exhaustion. The temperature was 102. Repeated stool examinations showed no amebas. A barium sulphate enema, August 2, showed that the colon filled rapidly and apparently normally with the exception of a contracted rectal pouch. The white blood count was then 14,000. During the first three weeks the patient had chills and fever, continued diarrhea, and increasing prostration. Instillation of 1:5,000 silver nitrate by rectum was given without improvement. Repeated search for amebas in the stools failed to reveal them. August 21, pain and localized tenderness developed in the right lower quadrant of the abdomen. August 28, exploratory laparotomy and appendectomy were performed. Free fluid was found in the abdomen; a smooth mass was found in the rectosigmoid colon, and the cecum was large and edematous. The appendix was inflamed. "This seemed to be more of a continuation of the same process that was in the cecum." The patient stood the operation well at first but then gradually failed and died, September 5.

Autopsy.—The abdomen showed a recent unhealed right rectus incision with considerable necrosis and sloughing of muscle and fascia. The large intestine was enormously distended with masses at the cecum, transverse colon and rectum. These were the sites of large ulcerations covered with thick, gray, necrotic membranes and surrounded by edematous fibrous and fatty tissues. The small intestine showed no evidence of ulceration. The liver contained in the right lobe an "encapsulated cavity filled with thick, dirty grayish material." Microscopic examination showed ulcerated areas containing many amebas and cysts, containing four nuclei. Purulent material from the hepatic cyst showed nonmotile Endamoeba histolytica.

CASE 4.—*History.*—A. C. L., Jr., sales manager of a lumber company in Louisiana, whose past history was unknown, had an attack of "indigestion," July 14, but went to Washington, D. C., from Louisiana the next day. The day after his arrival (July 18) he began to have diarrhea and indigestion but attended to business. July 20, he started home, suffering from intense diarrhea all the way, and arriving July 22, very much dehydrated. He was taken at once to a hospital. The stools were examined for amebas but were negative. He showed a positive Flexner agglutination and was given large doses of dysentery serum. He continued to grow worse and showed signs of peritonitis about July 28. Two days later, amebas were found in material from the ulcers removed by proctoscopy. The patient died, August 2, of peritonitis, in spite of active treatment started the day before.

Autopsy.—We have only fragmentary data and do not know whether autopsy was performed.

CASE 5.—R. L. K., executive of a lumber company in Louisiana, died from acute colitis, according to a letter from his brother, three weeks after the Chicago meeting. His physician has not sent any report as yet, and therefore it is not certain that he had amebic dysentery.

DIAGNOSIS

In the northern part of the United States, acute ulcerative colitis is probably more commonly due to a streptococcus or other similar organism than to amebas. Cases 1, 2 and 3 were all considered to be instances of such nonspecific colitis. There is apparently no way in which the two types of colitis can be told apart on clinical grounds alone.

Partial reference to recent literature shows that the symptoms and early course of amebic infections may be very variable. That is certainly true of the five cases reported here. Any abdominal condition may be simulated, and diarrhea sometimes never occurs in the whole course of the disease.[3] Surgeons who work in tropical countries have found that they must be constantly on their guard to avoid operation in cases of amebiasis under the diagnosis of acute appendicitis.[4] This is also seen well in an article on the occurrence of amebiasis in Spain.[5]

However, the one important fact shown by the cases in the present series is not that the symptoms are variable but that repeated negative examinations of the stools or of material from the ulcers removed by proctoscopy cannot be trusted to rule out amebiasis.

TREATMENT

Although each of these patients was of such standing in his community that he secured the services of some of the leaders in the profession, not one received treatment that can be considered adequate. There is no question that emetine is practically a specific for the acute attack when given before intestinal perforation has occurred, but none of these men were given it at all, except patient 4, who received it too late. After the diagnosis is suspected, not more than a few hours should be spent in laboratory or other investigations before specific treatment is started. Treatment must be given even if the tests are negative. The dose of emetine is 0.065 Gm. once a day, intramuscularly. Chiniofon or similar products are also useful and should be given at the same time as the emetine. The dose of chiniofon is 0.5 Gm. by mouth or 3 Gm. in 200 cc. of water to be retained by rectum. A good method is to give it by mouth and by enema on alternate days. A full discussion of the treatment of amebiasis may be found in an article by Willner.[6] The treatment of amebiasis to the extent of completely sterilizing all lesions is often difficult and will not be considered here. Emetine must not be given for more than six to ten days, as it is toxic and may lead to myocardial failure. However, if the patient has amebiasis, he will be greatly improved and the danger of acute perforation will be averted in less than ten days. The chiniofon also should be stopped for a while after ten days, although it is not as toxic as emetine.

3. Craig,[1] Musgrave, W. E.: Amebiasis, Am. J. Trop. Med. **11**: 469-503 (Nov.) 1931.

4. Reid, M. E.: Personal communication to the authors. Connor, F. P.: Surgery in the Tropics, Philadelphia, P. Blakiston's Son & Co., 1929.

5. MacDonald, Ian: Amebiasis in the Temperate Zone, Lancet **2**: 1404-1406 (Dec. 26) 1931.

6. Willner, Otto: Remedies Recently Introduced in the Therapy of Amebiasis, Medicine **6**: 341-374 (Sept.) 1927.

FREQUENCY OF AMEBIASIS

Amebiasis is considered to be a rare disease in the northern part of the United States and in Canada. It is probably not nearly so rare as it is supposed to be.[7] In 1932, only four cases and two deaths were reported in the whole of Massachusetts. Dr. Anderson feels that many diagnoses are made that are not reported and in addition that many more cases occur that do not have the correct diagnosis made. In view of the outbreak reported here, it is obvious that even if it has been a rare disease in the past it is a disease that must be given much more consideration in the future.

SUMMARY AND CONCLUSIONS

1. Four deaths occurred from amebic infection.
2. The infection was probably received from carriers, who were found to be working in the kitchens of a Chicago hotel.
3. Cases of suspected amebiasis must be given treatment by emetine or emetine together with chiniofon, irrespective of whether or not the diagnosis is confirmed by laboratory investigations.[8]

319 Longwood Avenue.

THE EXTENT OF THE RETENTION OF INGESTED ALUMINUM

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This paper is one of a series[1] on the hygienic aspects of aluminum cooking utensils. It deals with the extent to which aluminum is stored in the tissues under conditions of a varied alimentary supply of soluble aluminum salts.

The study of the elimination and the retention of aluminum is of importance, first, because aluminum is almost universally present in foodstuffs; secondly, because the metal is used extensively for the manufacture of cooking utensils and food containers; and, thirdly, because the data on the distribution of aluminum after feeding aluminum salts are of value in the elucidation of the absorption, retention and elimination of other metals.

In addition to its natural occurrence, aluminum may enter foodstuffs by contact with the metal or by the addition of salts of aluminum. The extent to which aluminum enters foods cooked in aluminum utensils has been shown elsewhere[1g] to be extremely small, being near the limits of detection. As was to be expected, acid foods and foods to which sodium bicarbonate had been added acquired more aluminum than did others. It was found also that more aluminum enters food from stained than from bright utensils, and that sugar retards this action.

The chemical properties of aluminum form a clear background for the study of its pharmacologic action. Aluminum hydroxide is amphoteric with an iso-electric point at about p_H 5.5. In the presence of the phosphate ion, an aluminum phosphate is formed, insoluble at about p_H 2.8 and lower acidities. The pure tertiary phosphate, $AlPO_4$, probably does not exist. Under the influence of water, various degrees of hydrolysis occur to give basic phosphates. Organic hydroxy acids tend to prevent the precipitation of aluminum as a phosphate. The formation and precipitation of aluminum phosphates in the alimentary tract are undoubtedly also influenced by foods and their digestion products.

The older literature on the fate of orally administered aluminum is confusing because of the employment of inadequate methods for determining aluminum in tissues. The newer published evidence, based on the application of more refined methods of analysis,[2] is "that the concentrations of aluminum in biological matter must invariably be very low."[2e]

EXPERIMENTAL

Selection of Animals.—Guinea-pigs were chosen in these experiments because they present another and a markedly susceptible species in their response to alimentary aluminum. Guinea-pigs readily consume a porridge type of diet in which soluble aluminum salts most suitable for absorption may be incorporated. The dietary habit of these animals is most favorable to maximum absorption of aluminum, for when food is constantly available for consumption their stomach and intestines contain food continuously.

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7. Anderson, N. W.: Personal communication to the authors. Craig.[1]

8. The authors have left out the names of the physicians by whom these cases were treated because the editor of THE JOURNAL desired this material at once, and it would have taken several days to submit copies of the paper to each one to receive his approval of it before publication. We wish to thank them most heartily for the full records that they have sent to us at considerable trouble to themselves. Due credit will be given in a later report.

In the article as it appears here, tables 3, 4, 5 and 6 are omitted. Reprints containing these tables will be furnished, gratis, on application to the Mellon Institute of Industrial Research.

From the Mellon Institute of Industrial Research, in which Dr. Cox is senior industrial fellow, Dr. Schwartze, Mr. Unangst and Mr. Murphy were formerly industrial fellows, and Miss Wigman is an industrial fellow.

1. The following papers have already appeared:

(*a*) Schwartze, E. W., and Hann, R. M.: A Preliminary Report upon the Utilization of the Spectrophotometer in the Determination of Minute Amounts of Aluminum, Science **69**: 167-170 (Feb. 8) 1929.

(*b*) Schwartze, E. W.; Murphy, F. J., and Hann, R. M.: Rolled Oats and Bran in a Scurvy-Producing Diet and the Negative Control Test, J. Nutrition **2**: 171-181 (Nov.) 1929.

(*c*) Schwartze, E. W.; Murphy, F. J., and Hann, R. M.: Studies of the Destruction of Vitamin C in the Boiling of Milk, J. Nutrition **2**: 325-352 (March) 1930.

(*d*) Schwartze, E. W.; Murphy, F. J., and Cox, G. J.: The Effect of Pasteurization upon the Vitamin C Content of Milk in the Presence of Certain Metals, J. Nutrition **4**: 211-225 (July) 1931.

(*e*) Cox, G. J.; Dodds, M. L.; Wigman, H. B., and Murphy, F. J.: The Effects of High Doses of Aluminum and Iron on Phosphorus Metabolism, J. Biol. Chem. **92**: xi (June) 1931.

(*f*) Cox, G. J.; Schwartze, E. W.; Hann, R. M.; Unangst, R. B., and Neal, J. L.: Occurrence and Determination of Aluminum in Foods: I. Determination of Aluminum in Organic Materials, Indust. & Engin. Chem. **24**: 403-405 (April) 1932.

(*g*) Beal, G. D.; Unangst, R. B.; Wigman, H. B., and Cox, G. J.: Occurrence and Determination of Aluminum in Foods: II. Aluminum Content of Foodstuffs Cooked in Glass and in Aluminum, Indust. & Engin. Chem. **24**: 405-407 (April) 1932.

(*h*) A Select, Annotated Bibliography on the Hygienic Aspects of Aluminum and Aluminum Utensils with a preface by Edward R. Weidlein and an introduction by George D. Beal. Published by Mellon Institute of Industrial Research, Pittsburgh, Pa. Distributed free on request.

2. These papers are as follows:

(*a*) McCollum, E. V.; Rask, O. S., and Becker, J. E.: A Study of the Possible Rôle of Aluminum Compounds in Animal and Plant Physiology, J. Biol. Chem. **77**: 753-768 (May) 1928.

(*b*) Myers, V. C.; Mull, J. W., and Morrison, D. B.: The Estimation of Aluminum in Animal Tissues, J. Biol. Chem. **78**: 595-604 (Aug.) 1928.

(*c*) Underhill, F. P., and Peterman, F. I.: Studies in the Metabolism of Aluminum: I. Method for Determination of Small Amounts of Aluminum in Biological Material, Am. J. Physiol. **90**: 1-14 (Sept.) 1929.

(*d*) Winter, O. B., and Bird, O. D.: The Determination of Aluminum in Plants: II. Aluminum in Plant Materials, J. Am. Chem. Soc. **51**: 2964-2968 (Oct.) 1929.

(*e*) Tourtellotte, D., and Rask, O. S.: Spectrographic Determination of Aluminum in Biological Ashes, Indust. & Engin. Chem., Anal. Ed. **3**: 97-102 (Jan.) 1931.

(*f*) Lewis, S. J.: The Assimilation of Aluminum by the Human System, Biochem. J. **25**: 2162-2167 (Dec.) 1931.

Constitution of the Experimental Diet.—The diet chosen had the composition shown in table 1. Its average nitrogen content was found to be 0.49 per cent; phosphorus, 0.154 per cent; calcium, 0.116 per cent. Of the various ingredients, pumpkin was used especially for its flavor; milk powder for calorific value and vitamins; starch for facilitating the reconstitution of the dried pumpkin colloids that resist imbibition of water, and bran for roughage. The food was cooked in a pyrex flask arranged as a double boiler. The lost water was replaced and the desired aluminum solution containing aluminum in the form of lactate [3] or of chloride, or a mixture of chemically equivalent proportions of these two salts was added to each respective batch type of food as required. Glass mixing and feeding dishes were used and silver-plated spoons were used for stirring. Ten grams of spinach was fed daily as an antiscorbutic.

TABLE 1.—*Composition of Ration*

Foodstuff	Percentage
Dehydrated pumpkin powder	6.0
Whole milk powder	7.0
Wheat bran	6.0
Corn starch	2.0
Water	69.0
Water or aluminum salt solution	10.0

Effect of Aluminum Phosphate Formation.—When half the phosphoric acid of an aqueous solution is combined with alkali, the solution is approximately neutral (pK secondary phosphoric acid = 7.16). If aluminum phosphate (approximately $AlPO_4$) is precipitated out of such a solution on the addition of aluminum chloride or lactate, the solution becomes more acid, for base is lost and the hydrochloric and lactic acids left in solution are stronger acids than secondary phosphoric acid. It is to be noted that this result is not due to hydrolysis of aluminum salts, which would give rise to an acid reaction, but that the acidification of a practically neutral food containing a phosphate must be explained in some other way. In our instance we have a food without dissolved aluminum, since it is eventually precipitated. Because it was conjectured that aluminum phosphate would be refractory to absorption in the intestine, it was deemed necessary to control the possible systemic effect of the increase of the acid in the diet. This fact accounts for our use of the three types of aluminum salt additions.

The addition of aluminum chloride to a diet that is neutral in reaction amounts to abstraction of an equivalent amount of phosphate, but the addition of only half an equivalent of hydrochloric acid:

$$(Na_2HPO_4 + NaH_2PO_4) + 2AlCl_3 = 2AlPO_4 + 3NaCl + 3HCl.$$

Aside from a tendency to phosphate starvation, there must be recognized in this instance the possibility for acidosis to occur. We were aware of this circumstance but proceeded nevertheless because we were interested in trying aluminum under any adverse circumstance whatever, especially since this chemical reaction also favors a greater acidity in the intestine than that of a neutral diet.

If aluminum is added as a mixture of stoichiometric amounts of aluminum lactate and aluminum chloride, the same reaction goes on, but lactic acid is liberated. The latter tends to increase the acidity of the intestine but does not tend to produce any acidotic condition in the system of the animal, as the acid is metabolized.

If aluminum is added as aluminum lactate, sodium lactate and lactic acid are formed. The acidity of the intestine probably remains practically the same as in the previously mentioned instance, but there is a distinct antiacidotic effect in the system. The extra lactic acid introduces another factor; namely, that of aluminum phosphate remaining in pseudosolution or in solution, and to this extent it would therefore favor absorption.

The addition of aluminum lactate duplicates as closely as possible the condition occurring when aluminum is added to food by virtue of solution of the metal. Any method of adding salt would be satisfactory, however, if only a small amount of aluminum were added. But for the larger amounts we chose all methods so as to have the factors mentioned under control.

Care and Feeding of Animals.—An amount of fresh food based on the average ad libitum consumption was offered daily, seven days a week. Any food unconsumed after twenty-four hours was removed and its weight deducted from the amount supplied. Tap water was given ad libitum by means of inverted bottles with pyrex tips. Bottles and cages were sterilized two or three times weekly. The guinea-pigs were housed separately in cages of knockdown construction, built of tinned iron wire screen and about 10 by 15 inches in area. The animals were elevated about 1 inch above the tray bottom, with a tinned wire screen through which feces could drop. The tin plating was replaced from time to time by redipping. Tin was used, because it had been shown by one of us [4] that this metal is not absorbed from the intestine and because tin is resistant to corrosion by the alkaline cresol bath used for sterilization.

TABLE 2.—*Recovery of Aluminum Added to Beef Liver*

	Before Ashing, Mg.	After Ashing, Mg.
Aluminum added	0.05	0.05
Aluminum present, blank	0.125	0.125
Aluminum found	0.1785 0.1725	0.1725 0.1715
Net recovery	0.0535 0.0475	0.0475 0.0465

After a preliminary observation period for excluding diseased animals, the guinea-pigs were divided into groups and each placed on a diet containing added aluminum (calculated as the metal) from zero (controls) to 1,167 parts per million of consumed food. The latter figure represented seven eighths of the stoichiometric equivalent of the total dietary phosphorus and, incidentally, about the maximum aluminum that would be consumed by animals, owing to the taste imparted to the diet.

Four series of experiments were conducted, the first two of long and the last two of short duration. Series 1 and 2 were with animals obtained from the Kansas State Agricultural College, Manhattan, Kan.; series 3 and 4, with animals from a local breeder-dealer.

3. Aluminum lactate was made by dissolving aluminum chloride in water, adding lactic acid, distilling off the hydrochloric acid and water, and allowing crystallization to occur. It could not be recrystallized from water, presumably because a basic lactate formed that was less soluble, although the aluminum content was approximately the same. We added a solution of the salts of aluminum to the animal diet, to insure that the aluminum was dissolved at least at the start.

4. Schwartze, E. W., and Clarke, W. F.: Some Observations upon the Pharmacology of Tin, J. Pharmacol. Proc. **31**: 224-225 (Jan.) 1931.

Analysis of Tissues.—All animals were killed with ether. They were immediately dissected with steel instruments, and the tissues were washed with distilled water and stored in sealed glass containers in an electric refrigerator. The colorimetric chemical method used for the determination of aluminum is described elsewhere.[1f] The recovery of aluminum added to samples of 25 Gm. of beef liver before and after ashing is shown in table 2.

The data in table 2 indicate that aluminum added to animal tissue can be recovered quantitatively within the experimental error of the method of analysis.

EXPERIMENTAL RESULTS

A summary of the chemical analyses of the aluminum feeding experiments will be found in tables 3 to 6. All analyses were done at random, except that those in tables 5 and 6 followed those in tables 3 and 4. For practical purposes the data may be divided into two groups, series 1 and 2 constituting a long-time feeding of added aluminum and series 3 and 4 a short-time feeding.

The analytic data reveal several outstanding characteristics, as follows:

There is more aluminum found in the case of the brain and spinal cord, the fewer the animals represented in the composite sample (series 1 and 2).

Both the liver and the heart groups of tissue within themselves may show only minor variations in aluminum content. Any difference between the experimental and the control animals as regards the soft tissues is relatively slight.

The highest content of aluminum in any group of tissues is found in the carcasses in series 3 and 4, composed of younger animals.

There is a considerable difference between the aluminum content in the carcasses of the controls of the first two series of experiments and the controls of the last two series.

The high content of aluminum when small samples were taken is probably due to the difficulties of analysis of small quantities of material. It was hoped that the grouping of the brains and spinal cords would provide a large enough sample for the accurate determination of the aluminum content. Experimental animals 17 and 68 provided only 11.2 Gm. of tissue, or a total of 0.028 mg. of aluminum. The aliquot used for analyses contained apparently only 0.0056 mg. of aluminum, approximately the limit of accuracy of our method.

The aluminum present in the soft tissues of those guinea-pigs receiving added aluminum salts indicates that aluminum is absorbed to a slight extent. However, the absorption as indicated by deposition in the tissues is not proportional to the aluminum concentration in the diet, as evidenced by the fact that no differences appear between animals receiving 25 parts per million and 350 parts per million of the metal. At 700 parts per million additional metal may be deposited because of the diminished protective action of the constant phosphorus intake. At some level below 25 parts per million, absorption may become proportional to concentration or complete absorption may occur. Certainly the level for complete absorption must be very low, or a higher aluminum content would be noted in the tissues.

The noticeably higher aluminum content of carcasses is apparently due to a slight deposition of aluminum in the relatively inactive tissue, the bones. The animals of series 1 and 2 were adults at the end of the experiment; those of series 3 and 4 were growing animals. The differences in the aluminum content of these two groups is probably due to the deposition of aluminum with calcium phosphate during growth and, later, its removal as bone development ceases. This difference, due to age, is apparent between both the experimental and the control animals. In fact, the old animals receiving added aluminum in series 1 and 2 had no more aluminum in their carcasses than the young controls of series 3 and 4. The controls of series 1 and 2 (old animals) contained so little aluminum that it could only be estimated as being below the lower limit of the method of analysis.

If cumulative effect is defined as a gradual increase of slowly eliminated material as a result of the absorption of repeated doses over a prolonged period, the result of which is to cause the delayed appearance of certain definite physiologic effects, then we have demonstrated that aluminum is not cumulative in its properties, as in the amounts absorbed there is no evidence whatever of a direct systemic action of aluminum. Its deposition reaches a maximum in soft tissues (less than one part per million in the guinea-pig) and is independent of the duration of feeding or of the concentration fed after the condition for maximum intestinal absorption has been reached. Furthermore, it has been shown that there is no direct relation between added dietary aluminum and the aluminum content of the carcass (bone), at least until such a time as the diet becomes inadequate in phosphate due to the addition of aluminum, and then only when the bone is actively growing.

It appears that the absorption of aluminum (and iron) from the digestive tract is governed by the dietary phosphorus, existing after digestion as phosphates. Aluminum lactate [5] and aluminum chloride were added to the diet in amounts stoichiometrically equivalent (1,400 parts per million) to the total phosphorus. With these large doses, the two salts were of practically equal potency in producing a complete deprivation of blood phosphorus, leading to a fatal outcome in about four weeks. This grossly exaggerated condition of aluminum concentration with reference to phosphorus in the diet can never be encountered with the aluminum naturally present in the diet or derived from aluminum utensils.

The hydrochloric acid, which is liberated as a result of the precipitation of aluminum phosphate by addition of aluminum chloride, apparently did not place any burden on the animal or have any influence on the absorption and deposition of aluminum. So far as could be told, these animals were precisely similar to those receiving all their aluminum as aluminum lactate, in which case there was an equal tendency toward alkalosis.

Our data and conclusions differ in certain respects from those which have been reported recently in the literature, since we have undertaken primarily the study of the pharmacodynamics of aluminum. Our analyses justify the earlier conclusions of McCollum, Rask and Becker [2a] that aluminum is not present in biologic material, since by our analytic method we can determine less aluminum than their method was capable of revealing. The aluminum concentrations in the

5. The tissues of these animals were analyzed by a method which was later shown to be unreliable and the data, therefore, are of no value. A preliminary report has been made [1e] on the effects of phosphorus starvation produced by the ration containing 1,400 parts per million of aluminum or an equivalent amount of iron. A complete report will be published later.

tissues of guinea-pigs that we have observed are lower than those reported by Myers and Mull [6] for rats and for man; and, moreover, our individual analyses are subject to less variation for similar tissues analyzed in a uniform way. We differ from Underhill and Peterman [7] in finding considerably less aluminum in guinea-pigs than they did in dogs. Our data are in very close agreement with those of Tourtelotte and Rask,[8] who found by spectrographic analysis of various control rat tissues from 0.05 to 1 part per million and from 0.2 to 1 part per million after feeding 600 parts per million of aluminum for three months. They concluded that "aluminum present in the diet is not absorbed and deposited." Lewis [2f] has ascertained by spectrographic technic that human blood is usually aluminum free but that small amounts, from 0.3 to 1.2 parts per million, may be found in the blood within forty-eight hours of a liberal feeding of aluminum salts. These studies are in general agreement with ours in demonstrating that the problem of aluminum deposition in tissue has now ceased to be one of major pharmacologic importance.

We do not place implicit confidence in variations between individual animals. There are few types of pharmacologic experiments in which one may not find variations with a maximum value of three or possibly even four times the minimum. This observation has made us cautious to accept any save the most apparent conclusions.

Considering the relatively small amount of aluminum that would get into the diet as a result of corrosion of aluminum metal in contact with food [1g] in comparison with the large daily intake of phosphorus, there appears to be no possibility of causing phosphorus deprivation with a normal dietary. Since there is no evidence in our data that the consumption of a large amount of aluminum can lead to any primarily pharmacologic action in the system, there can therefore be no medical objection to the consumption by human beings of a small amount (relative to the phosphorus content) of added aluminum, as the factor of safety is ample.

SUMMARY AND CONCLUSIONS

1. The aluminum content of fresh tissues of guinea-pigs receiving no added aluminum is about 0.4 part per million or less.

2. The carcasses of growing guinea-pigs on a diet containing no added aluminum have a higher content of aluminum than those of the adult animals.

3. Feeding of large amounts of soluble aluminum salts produces a barely detectable deposition of aluminum in the soft tissues (less than 0.5 part per million) and somewhat larger amounts (from 0.5 to 1 part per million) in carcasses.

4. No systemic pharmacologic effects can be ascribed directly to absorbed aluminum.

5. Aluminum does not appear to be cumulative in the tissues.

6. No harmful effects can be expected from soluble aluminum occurring naturally in foods or introduced by utensils into a diet of normal phosphorus content.

6. Myers, V. C., and Mull, J. W.: The Influence of the Administration of Aluminum upon the Aluminum Content of the Tissues and upon the Growth and Reproduction of Rats, J. Biol. Chem. **78**: 605-613 (Aug.) 1928.

7. Underhill, F. P., and Peterman, F. I.: Studies in the Metabolism of Aluminum: II. Absorption and Deposition of Aluminum in the Dog, Am. J. Physiol. **90**: 15-39 (Sept.) 1929.

8. Tourtellotte, D., and Rask, O. S.: The Absorption of Aluminum Compounds, Am. J. Hyg. **14**: 225-230 (Aug.) 1931.

Clinical Notes, Suggestions and New Instruments

HYPERSENSITIVITY TO EPHEDRINE AND EPHETONINE

MICHAEL ZELLER, M.D., CHICAGO

In 1923, Chen and Schmidt recommended the use of ephedrine in the treatment of hay fever, asthma and hypotension. Since then, considerable has been written regarding the therapeutic efficacy of the drug but very little mention has been made of the unfavorable effects that it may produce.

Scheer,[1] in 1929, was the first to report a case of dermatitis venenata of the nose and upper lip resulting from the local application of ephedrine in oil. Ramirez and Eller [2] observed four cases of contact dermatitis due to ephedrine. In 1931, Ayres and Anderson [3] reported similar cases following nasal and oral administration of ephedrine, but their cases presented, in addition, generalized scarlatiniform eruptions. Bullen, Frances and Parker,[4] in 1932, reported two cases of dermatitis medicamentosa due to ephedrine.

Following is the report of a case of dermatitis venenata due to nasal application of ephedrine inhalant:

REPORT OF CASE

Mrs. L. O., aged 42, seen in 1930, complained of hay fever, which commenced usually about August 15 and continued until frost. Skin tests revealed definite sensitization to the pollens of ragweed and burweed marsh elder, treatment for which was given. A sister and one son have hay fever. Two sons have asthma.

Ephedrine inhalant was prescribed for local relief of nasal symptoms. Following the third application of several drops in each nostril, itching and redness of the nose appeared. Within twelve hours this became increasingly worse, resulting finally in yellow crust formation about the alae nasi and diffuse redness and swelling of the nose. Accompanying the local lesion was a diffuse scarlatina-like eruption, appearing first on the forearms, hands, legs and feet and later on the chest and abdomen. This appeared and disappeared alternately for thirty-six hours and then cleared up completely until, three weeks later, desquamation appeared on the palms of both hands and between the fingers and toes. Intense itching was present over the area of the eruption.

EXPERIMENT

After the eruption had entirely disappeared, ephedrine hydrochloride in three-eighths grain (0.024 Gm.) doses was administered by mouth. Within three hours after the first dose, itching was noted on the flexor surfaces of the elbows and knees and between the fingers and toes.

After the fourth dose, twelve hours later, a generalized scarlatinal eruption appeared, associated with swelling, redness and crusting of the nose as before. These manifestations persisted for several days and gradually cleared up. Desquamation appeared again about three weeks after the initial eruption.

Ephetonine (synthetic ephedrine) administered by mouth produced itching of the hands and flexor surfaces of the elbows and knees within three hours after the administration of one tablet. Owing to the severity of the itching and eruption produced by ephedrine, the patient would not consent to further ingestion of ephetonine. Epinephrine hypodermically and locally in the nose produced no symptoms.

Scratch tests with ephedrine applied to the patient's forearm were distinctly positive in three hours. A similar test performed with ephetonine was positive in six hours. Controls in both instances were negative.

Patch tests on the patient done with ephedrine and ephetonine resulted in itching six hours later, and within twenty-

1. Scheer, Max: A Case of Dermatitis Venenata Due to Ephedrine, Arch. Dermat. & Syph. **20**: 641 (Nov.) 1929.

2. Ramirez, M. A., and Eller, J. J.: Intradermal, Scratch, Indirect and Contact Tests in Dermatology, J. A. M. A. **95**: 1080 (Oct. 11) 1930.

3. Ayres, Samuel, Jr., and Anderson, N. P.: Dermatitis Medicamentosa Due to Ephedrine, J. A. M. A. **97**: 437 (Aug. 15) 1932.

4. Bullen, S. S.; Francis, N., and Parker, J. M.: Dermatitis Medicamentosa Due to Ephedrine, J. Allergy **3**: 485 (July) 1932.

four hours a red scarlatina-like eruption appeared over the area of both patches. This skin response to the local application of ephedrine and ephetonine in the form of patch tests appeared identical to that produced by oral administration of ephedrine. Controls on the patient and nonsensitive individuals were negative.

Passive transfer tests were performed by injecting intradermally the serum of the patient into three normal nonsensitive individuals. After twenty-four hours, scratch tests with ragweed at the sensitized site in one of the normal individuals was positive within fifteen minutes. Scratch tests with ephedrine and ephetonine into the sensitized areas were negative. Controls in the same arm of the normal individuals were negative. Two of the normal individuals were given ephedrine hydrochloride by mouth prior to the experiment; thirty-six hours after the passive transfer, ephedrine hydrochloride in three-eighths grain doses was administered by mouth, but no alteration appeared in the sensitized skin areas.

SUMMARY

1. Patch tests and scratch tests were positive in a case of ephedrine and ephetonine hypersensitivity and appear to be of value from a diagnostic standpoint. The mechanism of the scratch response may have been due to simple contact, as in the patch test.

2. Persons not tolerating the use of ephedrine will probably also prove hypersensitive to ephetonine.

3. Passive transfer tests in a person sensitive to ragweed, ephedrine and ephetonine were positive with ragweed but not with ephedrine and ephetonine.

4753 Broadway.

CONGENITAL ATRESIA OF THE ESOPHAGUS: A NEW DIAGNOSTIC TECHNIC

GABRIEL TUCKER, M.D., AND EUGENE P. PENDERGRASS, PHILADELPHIA

The mortality rate, so far as I have been able to determine, is 100 per cent in congenital atresia of the esophagus. Death is not due to starvation in most cases, but to pulmonary complications from the aspiration of secretions and from the return of fluids and foods when a gastrostomy has been done through the lower segment of the esophagus.

The usual method of diagnosis is the administration of a bismuth preparation or barium sulphate with roentgen study. This outlines the pouch, and if the upper segment of the esophagus communicates with the trachea, the mixture passes

Fig. 1.—Infant bronchoscope within the trachea. An opaque catheter has been introduced through the bronchoscope through the tracheoesophageal fistula and lower segment of the esophagus into the stomach.

into the tracheobronchial tree. If there is no communication between the upper segment of the esophagus and the trachea, unless great care is exercised there will be an overflow and secretions will be aspirated into the trachea, in many cases contributing largely to the pulmonary complication.

Read before the Section on Laryngology, Otology and Rhinology at the Eighty-Fourth Annual Session of the American Medical Association, Milwaukee, June 16, 1933.

A female infant 3 days of age was referred to the Bronchoscopic Clinic at the Hospital of the University of Pennsylvania by Dr. Richard Meade of Philadelphia, with a history of inability to swallow and regurgitation of all fluids from birth. The child was apparently well developed and well nourished.

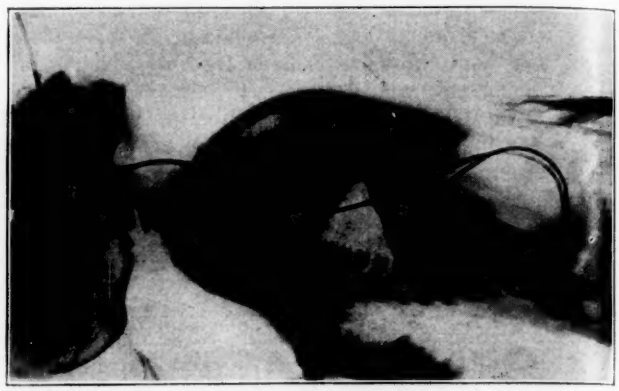

Fig. 2.—An opaque catheter within the larynx and trachea and lower esophageal segment, establishing the diagnosis of congenital atresia of the esophagus, type 3 B.

The following technic was used in examination of the esophagus:

The child was placed on a fluoroscopic table, and all secretions were aspirated from the pharynx and the upper segment

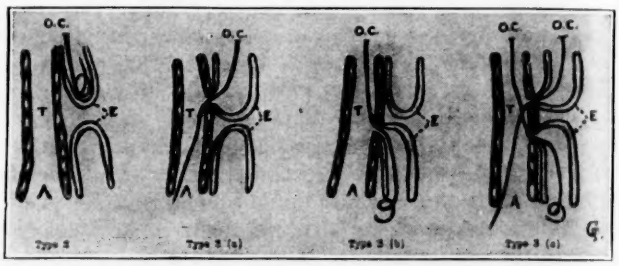

Fig. 3.—Diagram illustrating the use of the opaque catheter in the differential diagnosis of the types of congenital esophageal atresia. *O. C.* indicates opaque catheter; *T*, trachea, and *E*, esophagus. (Adopted from E. P. Vogt.)

of the esophagus. A 3.5 mm. esophagoscope was passed into the upper segment of the esophagus, which was found to terminate in a blind pouch above the level of the suprasternal notch. A small amount of thin bismuth mixture was then given, 1 teaspoonful, and a film was made showing the outline of the upper segment of the esophagus. The bismuth solution was then aspirated from the upper segment of the esophagus, a 3.5 mm. infant bronchoscope was passed, and the lower portion of the trachea was explored. A fistulous tract was found in the posterior tracheal wall, just at the entrance of the left bronchus. A small opaque ureteral catheter was passed through the bronchoscope into the fistulous opening, and under fluoroscopic guidance it was seen to pass into the lower segment of the esophagus and on into the stomach. This established the diagnosis of a communication between the lower end of the trachea and the upper end of the lower segment of the atresic esophagus. Gastrostomy was done by Dr. I. S. Ravdin, and the lower end of the esophagus was tied off. Gastrostomy feeding was carried out, and the child progressed favorably for several days. Pulmonary complications finally developed from aspirated secretions due to overflow, and postmortem examination showed that the closure of the lower end of the esophagus was successful in preventing the passage of fluids from the stomach into the trachea.

CONCLUSION

A case of type 3 A congenital atresia of the esophagus is presented, of the more frequently occurring type. A method of combined roentgen and esophagoscopic technic is presented for determination of the exact type of atresia and the preven-

tion of aspiration of opaque mixtures into the tracheobronchial tree.

It is suggested that, with the establishment of a fistula in the neck from the upper segment of the esophagus, in order to prevent aspiration of secretion, later resection or dilation of the strictured area might be accomplished.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH, Secretary.

DIPHTHERIA TOXOID (See New and Nonofficial Remedies, 1933, p. 384).

E. R. Squibb & Sons, New York.

Diphtheria Toxoid-Squibb (See New and Nonofficial Remedies, 1933, p. 386).—Also marketed in packages of one vial containing 1 cc. of diluted diphtheria toxoid for the reaction test.

ANAEROBIC ANTITOXIN (See New and Nonofficial Remedies, 1933, p. 359).

The National Drug Co., Philadelphia.

Gas Gangrene Antitoxin, Refined and Concentrated.—An antitoxic serum prepared by immunizing horses individually against the toxins of B. perfringens (B. welchii) and vibrion septique. After the desired degree of potency is obtained, the horses are bled, the plasma is separated and the serum is prepared in a manner similar to that used for other antitoxic serums. The product is concentrated and refined by a method which is similar to that used for diphtheria antitoxin. The unit values of the constituents are determined according to the method described by the National Institute of Health. Marketed in packages of one syringe containing 10,000 units of perfringens antitoxin and 10,000 units of vibrion septique antitoxin.

Dosage.—The contents of one syringe, preferably by intravenous or intramuscular injection, repeated in from eight to twenty-four hours, as required.

Tetanus-Perfringens Antitoxin, Refined and Concentrated.—An antitoxic serum prepared by immunizing horses individually against the toxins of B. tetani, B. perfringens (B. welchii) and vibrion septique. After the desired degree of potency is obtained, the horses are bled, the plasma is separated and the serum is prepared in a manner similar to that used for other antitoxic serums. The product is concentrated and refined by a method which is similar to that used for diphtheria antitoxin. The unit values of the constituents are determined according to the method described by the National Institute of Health. Marketed in packages of one syringe or one ampule-vial containing 1,500 units of tetanus antitoxin, 2,000 units of perfringens antitoxin and 2,000 units of vibrion septique antitoxin.

Dosage.—For prophylaxis, the contents of one syringe, or ampule-vial, injected subcutaneously or intramuscularly; for treatment, the contents of three or four ampule-vials, or syringes, injected intravenously.

ERYSIPELAS ANTISTREPTOCOCCUS SERUM (See New and Nonofficial Remedies, 1933, p. 370).

The National Drug Co., Philadelphia.

Erysipelas Antistreptococcus Serum.—The serum is obtained from horses immunized with hemolytic streptococci isolated from patients with erysipelas, also with the toxins produced by these organisms. It is concentrated and refined by a method similar to that used for diphtheria antitoxin. Marketed in packages of one syringe containing 10 cc., the average initial therapeutic dose.

DIPHTHERIA IMMUNITY TEST (SCHICK TEST) (See New and Nonofficial Remedies, 1933, p. 398).

The National Drug Co., Philadelphia.

Schick Test, Peptone Diluent.—(See New and Nonofficial Remedies, 1933, p. 400).—For the control test, the product is supplied in single vial packages of 1 cc. and 5 cc., containing, respectively, sufficient heated diphtheria toxin diluted with peptone solution, for ten and fifty control tests.

TUBERCULIN-KOCH (See New and Nonofficial Remedies, 1933, p. 377).

The National Drug Co., Philadelphia.

Tuberculin Old (Human).—(See New and Nonofficial Remedies, 1933, p. 380).—Also supplied on special order, in 10 cc. ampule vials of five serial dilutions; dilutions 1 to 4 representing in each two minims, respectively, 0.001 mg., 0.01 mg., 0.1 mg., and 1 mg. of old tuberculin, and dilution 5 representing 10 mg. of old tuberculin in each minim.

EPHEDRINE SULPHATE-ABBOTT (See New and Nonofficial Remedies, 1933, p. 192).

The following dosage forms have been accepted:

Capsules Ephedrine Sulphate-Abbott, ⅛ grain.
Capsules Ephedrine Sulphate-Abbott, ½ grain.
Capsules Ephedrine Sulphate-Abbott, ¼ grain.
Solution Ephedrine Sulphate-Abbott, 3%: It is preserved with chlorbutanol 0.5%.

Committee on Foods

ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION, AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.

RAYMOND HERTWIG, Secretary.

COLMAN'S MUSTARD

Distributor.—Atlantis Sales Corporation, Rochester, N. Y.

Manufacturer.—J. & J. Colman, Limited, London and Norwich.

Description.—A blend of yellow and black mustard flours.

Manufacture.—Yellow and black mustard seeds are separately graded and cleaned of foreign materials and seeds by the usual commercial processes for cleaning grain and seeds. The seeds are crushed between rolls; the crushed material is sieved to remove the hulls. The resultant finely ground yellow and black mustard flours are blended in definite proportions to maintain a uniform standard product, which is packed in tins.

Analysis (submitted by manufacturer).—

	per cent
Moisture	4.1
Ash	4.4
Acid insoluble ash	0.2
Fat (ether extract)	35.0
Nitrogen	5.4
Protein (nonallyl isothiocyanate N × 6.25)	32.9
Crude fiber	1.0
Copper reducing substances as dextrose by direct acid hydrolysis method	7.3
Allyl isothiocyanate	0.7

Claims of Manufacturer.—Conforms to the United States Department of Agriculture standard and definition.

HAWAIIAN FINEST QUALITY PINEAPPLE

(VACUUM PACKED) (CRUSHED, SLICED AND TIDBITS)
(1) DORIS, (2) RIVAL, (3) SNOW BALL, (4) HONEY GROVE, (5) WHITE VILLA BRANDS

Packer.—Hawaiian Pineapple Company, Ltd., San Francisco.

Distributors.—1 and 2, Rival Foods, Inc., Cambridge, Mass. 3, G. E. Howard & Company, Newburg, N. Y. 4 and 5, the Cincinnati Wholesale Grocery Company, Cincinnati.

Description.—Canned pineapple (sliced, crushed and tidbits) packed in concentrated pineapple juice syrup with added sucrose. The same as Doles 1, 2 and 3 Hawaiian canned pineapple products (THE JOURNAL, April 8, 1933, p. 1106, and April 29, 1933, p. 1338).

TOWN TALK HIGHEST GRADE FLOUR (BLEACHED)

Manufacturer.—Lawrenceburg Roller Mills Company, Lawrenceburg, Ind.

Description.—Hard winter wheat short patent flour; bleached.

Manufacture.—Selected hard winter wheat is cleaned, scoured, tempered and milled by essentially the same procedures as described in THE JOURNAL, June 18, 1932, page 2210. Chosen flour streams are blended and bleached with nitrogen oxide.

Claims of Manufacturer.—An "all purpose" flour.

TOPMOST TOMATO JUICE

Packer.—American Packing Corporation, Evansville, Ind.

Distributor.—Tibbits-Hewitt Grocery Company, St. Louis.

Description.—Pasteurized tomato juice with a small amount of added salt; retains in high degree the vitamin content of the raw juice. The same as Loudon Brand Tomato Juice (THE JOURNAL, June 25, 1932, p. 2289).

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SATURDAY, NOVEMBER 25, 1933

THE MINERALIZATION AND VITAMINIZATION OF MILK

The urge to devise perfect foods was never more compelling among the producers of nutriment than it is at present. The term foods refers here to individual items of the diet rather than to the general regimen, which may comprise a great variety of individual foods. There is a belated but growing appreciation of the fact that nature has not provided any single article of food that alone is adequate or perfect for all persons. Even milk is currently described as "nature's most nearly perfect food," thereby indicating that it has some limitations. Today the science of nutrition is no longer satisfied to speak in terms of proteins, fats and carbohydrates alone. As Professor Sherman [1] remarked in a recent address before the American Chemical Society at Chicago, if something of the order of thirty-odd chemical entities (elements or compounds, as the individual case may be) must be nutritionally supplied to the body from without, besides all the substances that it makes within itself, application of the algebra of combinations and permutations will soon show that a human lifetime would not be sufficient for the consideration of all possible interrelations. Plainly this promises to be almost too fertile a field, a region in which the investigator must guard against losing himself in a jungle growth of interrelationships.

The newer knowledge has begun to stress the special rôles of individual inorganic elements — the so-called mineral nutrients. Some of them loom large in importance despite the fact that quantitatively they may be required or desirable in scarcely more than traces, such as a few milligrams of iron or even less of iodine. Other essentials, like the vitamins, also belong in the category of the "little things in nutrition" that count in a large way. Sherman has emphasized that scientifically the vitamins should not go under a group name, for they are not a sufficiently similar or related group of substances. The more one learns about the vitamins, the less alike do they appear. That they have been so grouped, he adds, is the accidental result of their existence having been discovered and their nutritional importance established in too rapid a succession for the actual physical isolation and complete chemical identification of the substances to keep pace, even though many able chemists have been working actively on the pure chemistry of these compounds.

The unique significance of milk in the American dietary offers the excuse—or perhaps one should say the reason—for attempting to improve it nutritionally as well as from a sanitary standpoint. Even the question of pasteurization has not passed entirely beyond the stage of debate in some quarters. The "modification" of milk, notably for infant feeding, has long been practiced. Originally this involved abstraction of certain components, such as the cream with its richness in fats, the dilution of milk with water, or the combination of dilution with addition of carbohydrate or energy-yielding products. Recent proposals include what have been called the "mineralization" and the "vitaminization" of milk.[2] It may properly be asked whether the addition of inorganic compounds and vitamin products to market milk as it is ordinarily produced is justifiable.

In attempting to answer this question, Krauss [2] of the Ohio Agricultural Experiment Station at Wooster has pointed out that mineralization of milk has confined itself to the three elements iodine, iron and copper. Advocates of iodine and of products containing iodine are urging the use of this element in the feeding of dairy cattle, not only because of any benefits the cow may receive but because of the resulting "iodized milk," which may help to solve the goiter problem. Demonstrations made in many laboratories showing that milk is deficient in iron and copper have led many to believe that these two minerals need to be added to milk. With reference to iodine, Krauss believes that the goiter problem is sufficiently complicated already without introducing into the field another material containing iodine, in which the amount of iodine is difficult to control and more difficult to determine. It would seem to be a function of a group of investigators in dairy problems, he believes, to study the fundamentals of the production of iodized milk and to determine the iodine content of market milk in order to allow the medical profession to be guided in its course of action along therapeutic lines. For the present one may disregard the problem of fortifying milk with iron and copper for the infants that have a considerable storage of iron and copper which serves to tide them over until the time when foods with an adequate content of iron and copper can be added to the diet. From the adult standpoint, Krauss contends, the fortification of milk with iron and copper would seem to be an entirely superfluous procedure, except in the treatment of certain

1. Sherman, H. C.: A Century of Progress in the Chemistry of Nutrition, Scient. Monthly, November, 1933, p. 442.

2. Krauss, W. E.: Should the Mineralization and Vitaminization of Milk Become General? Bimonthly Bull. 164, Ohio Agric. Exp. Sta. 18: 126 (Sept.-Oct.) 1933.

anemias in which it is desired to administer iron and copper through the medium of milk.

Recorded assays show that milk may be rated as an excellent source of vitamin A, a fair to good source of vitamin B, a variable source of vitamin C, a poor source of vitamin D and an excellent source of vitamin G, and that it contains vitamin E. The feed of the cow plays an important part in determining the amount of each vitamin, except B and G, in milk. Most authorities will agree with Krauss that the haphazard addition of all sorts of vitamins and mineral elements to milk would jeopardize the unique and excellent position now enjoyed by this product in the eyes of the general public and the medical profession. Krauss's conclusions deserve widespread quotation. In spite of the intriguing mystery and glamor that surround some of the newer discoveries in nutrition, he states, the fact must not be lost sight of that plain, ordinary milk is the best single food available and is thus considered by all. The fact that a sufficient intake of calcium cannot be obtained except by the inclusion in the diet of some form of milk or cheese places these dairy products on a pedestal by themselves. However, the incidence of rickets is still greater than it need be. In the past, dependence has been placed on such antirachitic agents as cod liver oil, viosterol and sunshine, natural and artificial. It is not because of the ineffectiveness of these sources of vitamin D that rickets still exists. Rather, it is because of insufficient or unfaithful use of these materials, for which condition parents are probably chiefly responsible. Whatever the explanation may be, the fact remains that the incidence of rickets is still too great and will continue to be until some cheap, generally available, agreeable source of vitamin D is provided. Vitamin D milk seems to offer promising possibilities of meeting these requirements.

TUBERCULOUS BACILLEMIA

Interest in tuberculous bacillemia has been renewed because of the clear discrepancies in recent studies of blood cultures. The work of Löwenstein[1] and his associates has been disappointing, since most other investigators using Löwenstein's technic have obtained contradictory results. Löwenstein obtains cultures of tubercle bacilli from the blood by centrifugating from 8 to 10 cc. of the citrated blood, destroying the erythrocytes with 3 per cent acetic acid and, after washing in distilled water, inoculating the sediment on tubes of Löwenstein's asparagin egg medium. Löwenstein examined in this manner more than 4,000 cases and reported that tubercle bacilli are present in the blood of patients suffering from progressive forms of tuberculosis (from 39 to 100 per cent), renal tuberculosis (59 per cent), laryngeal tuberculosis (55 per cent), miliary, meningeal and intestinal tuberculosis (from 80 to 100 per cent), acute and chronic polyarthritis (67 per cent), chorea, multiple sclerosis, schizophrenia, and retrobulbar neuritis (48 per cent). The finding of tubercle bacilli in the blood in chorea, polyarthritis and multiple sclerosis was quite unexpected and required explanation.

Since 1930, many investigators have been unable to confirm Löwenstein's work. Wilson[2] has subjected the entire question to a critical review and has exposed numerous fallacies in technic, which should be avoided hereafter in all examinations for the tubercle bacillus. Acid-fast bacilli are found in commercial distilled water, in reagents made up with distilled water, in tap water, in metal taps, on leather and rubber washers, and in preparations of pepsin and trypsin. Saprophytic acid-fast bacilli occur in dust, milk, grass, smegma, butter, manure, soil, human feces and blood, and in the intestinal contents of insects. Many types of saprophytic acid-fast bacilli cannot be distinguished morphologically from the tubercle bacillus. Another source of error is the presence of artefacts due to fibrin threads, hemin crystals, oxalate crystals, partly disintegrated leukocytic granules, lipoid portions of the erythrocyte envelop, and crystals of lecithin and cholesterol.

Still another source of error may be the technic and interpretation of animal inoculations. Many observers have failed to exclude spontaneous tuberculosis, pseudotuberculosis, Salmonella and Alcaligenes infections, and occasionally pyogenic infections that may cause lesions simulating tuberculosis. In only 32 of 512 cases reported in which examination was made by animal inoculations may the results be regarded as positive. Critical study of the results of animal inoculation indicates that genuine tubercle bacilli have been demonstrated in the blood in about 4.9 per cent of patients with severe pulmonary tuberculosis, 36.4 per cent of patients with miliary or meningeal tuberculosis, and 2.7 per cent of patients with nonpulmonary tuberculosis. Wilson, commenting on Löwenstein's figures, maintains that his criteria for identification of the tubercle bacillus are inadequate and subject to the technical fallacies just stated. In work subsequent to Löwenstein's, 5,573 blood cultures from tuberculous and nontuberculous patients yielded tubercle bacilli in 72 instances. Although rare in the early stages of pulmonary and nonpulmonary tuberculosis, a bacillemia may occur in from 5 to 10 per cent of patients with severe advanced pulmonary tuberculosis and in from 30 to 40 per cent of those with miliary and meningeal tuberculosis.

Wilson states that there is no reliable evidence that a tuberculous bacillemia occurs in articular rheumatism, polyarthritis, chorea, multiple sclerosis, schizophrenia, retrobulbar neuritis or Hodgkin's disease; nor is there any reason for implicating the tubercle bacillus as an

1. Löwenstein, E.: Das Vorkommen der Tuberkelbazillämie bei verschiedenen Krankheiten, München. med. Wchnschr. **78**: 261 (Feb. 13) 1931; Vergleich der Leistungsfähigkeit von Tierversuch und Kulturverfahren, Zentralbl. f. Bact. (part 1) **123**: 510 (Feb. 3) 1932.

2. Wilson, G. S.: Tuberculous Bacillemia, Special Report Series 182, Medical Research Council, London, 1933.

etiologic agent in these diseases. However, tuberculous polyarthritis and articular rheumatism have been described by Poncet.[3] Recently Cooperman [4] reported four cases of rheumatoid arthritis, which, after arthrotomy, study of the tissues and animal inoculations, proved to be tuberculous in nature. This aspect of the question has not received the attention it deserves. Nevertheless, bacillemia of sufficient severity to be recognized by laboratory methods now in use, except as a transitory occurrence, is but rarely present in tuberculosis until the infection has reached an acute stage, associated with extensive lesions or generalization.

Finally, in any investigation no acid-fast organism should be accepted as the tubercle bacillus until it has been demonstrated conclusively to be such by cultural, morphologic and pathogenic tests, due precaution being taken to avoid all positive external sources of error.

THE CHOICE OF OPERATION FOR DUODENAL ULCERATION

The old controversy as to medical or surgical treatment of peptic ulcer, although not finally settled perhaps, has resulted in a somewhat satisfactory compromise. Many surgeons, among them Horsley,[1] try medical treatment for duodenal ulcer, and if this fails they operate. For gastric ulcer, because of the danger of malignant change, they recommend immediate resort to surgical measures.

The problem remains, however, as to what operation should be performed for duodenal ulcer. A contribution to the solution of this problem is Gaither's [2] recent survey and report. His conclusions are overwhelmingly in favor of conservative operations such as gastro-enterostomy. Strauss's discussion of Gaither's paper, nevertheless, is good evidence that the adherents of gastric resection in this country will not be downed, and the fairly widespread practice of performing radical resection in the clinics of central Europe is well known. The medical profession in general would welcome more accord among authorities on the question raised. Such accord possibly will be delayed until disputants take into account a factor to which attention has been called but little attention given. This factor is the variability of the pathologic conditions that require treatment.

Sebening [3] of Frankfort-on-Main has shown that the type of gastroduodenal ulceration which prevails in central Europe is not the type which prevails in central North America. It is evident, from his report, that he made his comparison of the two types of lesions while he was sojourning in this country; thus, he had seen material on both sides of the water. He demonstrated, by means of photographs [4] taken in Schmieden's clinic, what Konjetzney [5] had described; that is, the almost constant association, in Germany, of gastritis with duodenal ulcer. The gastric change consists in diffuse inflammation, for the most part ulcerative in nature. This demonstration confirmed an observation made in Germany the year before by Walters and Snell [6] and tentatively reported by them. It may be that in central Europe economic factors and conditions of medical practice result in patients receiving surgical care later than on this continent. If this is so, duodenal ulcers in central Europe probably are larger and produce more obstruction and consequent gastric trauma. The other factor in the comparison can be more briefly stated: In central North America, involvement of the stomach in association with duodenal ulcer is not a prevailingly characteristic finding.

It seems apparent, therefore, that gastro-enterostomy and other conservative operations would fail to produce the desired results in a large percentage of cases encountered in central Europe, and that the higher mortality rate that partial gastric resection probably entails must be accepted there. However, in central North America, conservative operations would seem rather generally justifiable, unless it could be shown that recurrent ulcer appears in an undue proportion of cases. Nevertheless, even here a number of surgeons favor radical operation for duodenal ulceration; and surgical thought on the subject is not homogeneous. The United States presents many different environments, and its people belong to different racial groups, which in many regions are somewhat segregated. The patients of one physician may differ greatly from those of another. Unless North American surgeons are thoroughly satisfied that the demonstrated differences between gastroduodenal ulceration as encountered generally in central Europe and generally in central North America cannot be demonstrated when the clientele of one North American surgeon is compared with the clientele of another, further investigation of the possibility might be worth while. The pathologic and biometric study that this would involve might result in accord being reached on the middle ground that no operation is preferable of itself but that choice of operation should be deferred until after exploration and thorough inspection have made known whether or not the stomach is involved. Moreover, it must be recognized that there are variations in the capabilities of surgeons, in operative facilities, and in similar factors. This situation emphasizes again the necessity for individualization by each physician of each patient whom he sees.

3. Poncet, A.: Rhumatisme articulaire tuberculeux, Bull. et mém. Soc. méd. d. hôp. de Paris **68**: 464, 1909.
4. Cooperman, M. B.: Chronic Tuberculous Polyarthritis, Ann. Surg. **96**: 1065 (Dec.) 1932.
1. Horsley, J. S., in discussion on Gaither.[2]
2. Gaither, E. H.: Eventual Results of Gastric Surgery, J. A. M. A. **101**: 966 (Sept. 23) 1933.
3. Sebening, Walter: Why Partial Gastric Resection Is Preferred for Peptic Ulcer in Germany, Proc. Staff Meet., Mayo Clin. **7**: 139 (March 9) 1932.
4. Walters, Waltman, and Sebening, Walter: A Comparison of Lesions Associated with Duodenal Ulcer in Germany and in the United States, Minnesota Med. **15**: 579 (Sept.) 1932.
5. Konjetzney, G. E., cited by Sebening and by Walters and Sebening.
6. Walters, Waltman, and Snell, A. M.: Peptic Ulcer as Seen in Central Europe, Proc. Staff Meet., Mayo Clin. **6**: 380 (June 24) 1931.

Current Comment

VITAMIN C THERAPY

In the majority of cases, guinea-pigs maintained on a diet deficient in vitamin C will develop ulcerative lesions of the intestine, if fed daily doses of tuberculous sputum. If this deficiency diet is supplemented by an adequate amount of tomato juice (vitamin C), however, the animals almost invariably remain free from intestinal tuberculosis. Since the guinea-pig and man are apparently identical in their vitamin C requirements, McConkey and Smith [1] of the New York State Hospital for Incipient Pulmonary Tuberculosis conclude that tomato juice therapy has a verifiable rationale in certain forms of clinical tuberculosis. This conclusion would seem to be timely because of the popular interest in vitamin A as a so-called anti-infective vitamin. Current vitamin charts [2] suggest that vitamin A (cod liver oil) is the only known vitamin with anti-infective properties. The New York investigators, however, could not verify this much advertised claim. In their hands, sputum-fed guinea-pigs were not protected from intestinal tuberculosis by cod liver oil. They emphasize, however, that this failure is of questionable clinical significance, since man and the guinea-pig are widely different in their normal requirements of vitamins A and D.

Association News

MEDICAL BROADCAST FOR THE WEEK

Talks over Network of the National Broadcasting Company

The American Medical Association broadcasts each Monday afternoon from 3 to 3:15, Eastern standard time (2 o'clock, central standard time). The subject for Monday, November 27, is "Dodging the Common Cold." The speaker will be Dr. W. W. Bauer, director, Bureau of Health and Public Instruction, American Medical Association. Subjects and speakers for subsequent broadcasts will be announced weekly in THE JOURNAL.

Radio Talks from Station WBBM

The American Medical Association broadcasts on Tuesday and Thursday mornings from 8:55 to 9 o'clock, central standard time, over Station WBBM (770 kilocycles, or 389.4 meters). The subjects for the week are as follows:

November 28. **Give Thanks.**
November 30. **Holiday; no broadcast.**

There is also a fifteen minute talk sponsored by the Association on Saturday morning from 9:45 to 10 o'clock over Station WBBM.

The subject for the week is as follows:

December 2. **Straight as a Ramrod.**

THE CLEVELAND SESSION

Application Blanks for the Scientific Exhibit

Application blanks are now available for space in the Scientific Exhibit at the Cleveland Session of the American Medical Association, June 11-15, 1934. The Committee on Scientific Exhibit requires that all applicants fill out the regular application form and requests that this be done as early as convenient.

Persons desiring application blanks should address a request to the Director, Scientific Exhibit, American Medical Association, 535 North Dearborn Street, Chicago.

1. McConkey, Mack, and Smith, D. T.: J. Exper. Med. **58**: 503 (Oct.) 1933.
2. Weston, W., and Levine, H.: Vitamin Chart, 1931.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ARKANSAS

District Meetings.—Speakers before the First District Councilor Medical Society at Paragould, October 18, included Drs. Julius Frischer, Kansas City, Mo., on transurethral electrosurgery of the prostate; John H. McCurry, Cash, tularemia; Conley Sanford, Memphis, diagnosis of pernicious anemia, with special reference to atypical forms, and William C. Chaney, Memphis, calcium metabolism and its practical application in the practice of medicine.——At a meeting of the Third Councilor District Medical Society, October 19, the speakers were Drs. Silas C. Fulmer, Little Rock, "Classification of Heart Diseases"; James A. Warner, St. Louis, "Successful Treatment of Biological Diseases, or Biological Therapy"; Carrol C. Turner, Memphis, Tenn., "Emotions and Their Relationship to the Glands of Internal Secretion"; Willis C. Campbell, Memphis, "Practical Application of Orthopedic Principles," and Herman W. Hundling, Little Rock, "Uterine Bleeding."——The Second Councilor District Medical Society heard the following physicians at its meeting in Batesville, October 9: Howard A. Dishongh, Little Rock, "Symptoms, Diagnosis and Treatment of Undulant Fever"; Darmon A. Rhinehart, Little Rock, "Injuries of the Wrist—Clinical Varieties, Anatomical Considerations, and X-Ray Diagnosis"; Lee V. Parmley, Little Rock, "Injuries of the Wrist: Their Treatment," and Royal J. Calcote, "Impaired Vision and Blindness of Children." Dr. Frank A. Gray presented a case of Banti's disease.—— The Eighth Councilor District Medical Society was addressed in Little Rock, November 1, among others, by Drs. Rutherford B. H. Gradwohl, St. Louis, on "History of the Blood"; Augustus C. Shipp, Little Rock, "Tuberculosis," and Alexander C. Kirby, Little Rock, "Birth Injuries."

CALIFORNIA

Outbreaks of Food Poisoning.—Bacterial poisoning in ice cream served at a church supper in Los Angeles, October 11, was held responsible for the illness of more than 100 persons who attended, newspapers reported. Traces of an arsenic insecticide were found in the broccoli served at a dinner in Los Angeles, October 15, causing the illness of more than twenty persons. As the result of this outbreak, a preventive and educational drive on the use of poisonous insecticides as vegetable sprays was begun among gardeners in the state.

Society News.—Speakers before the San Francisco County Medical Society, November 14, included Drs. Ralph A. Reynolds and Hermann Becks on "Recent Developments in Paradentosis (Pyorrhea) Research," and Ludwig A. Emge, "Experimental Studies in Tumor Growth: The Behavior of a Transplantable Benign Rat Tumor During a Period of Five Years."——A joint meeting of the Los Angeles Surgical Association and the Los Angeles County Medical Association was addressed, November 10, by Drs. Josiah Morris Slemons, among others, on "Recognition and Treatment of Ectopic Pregnancy."——For the first time in the history of San Francisco, not a single case of smallpox was reported during the past year.

Illegal Practitioner Woelfli Sentenced.—Frederick Woelfli was recently sentenced to serve 125 days in the Napa County Jail, following his conviction of violating the medical practice act. There is also an abortion charge pending against Woelfli. When he was arrested, photographs of a diploma purporting to show his graduation from Rush Medical College, Chicago, and his licensure in Illinois, were found in his possession. Woelfli claimed that the originals were in the care of "some relative of his." Another photograph was of a diploma headed "Crane Sanitarium, School of Natural Therapeutics," dated Elmhurst, Ill., Sept. 30, 1927, stating that he had completed a course of instruction in "Natural Therapeutics." Of the four persons who signed the Crane diploma, only one, Dr. Milo A. Crane, is a doctor of medicine, according to the records of the American Medical Association. In 1927, Crane was expelled from membership in the Chicago Medical Society for unethical conduct. Neither the sanatorium nor its drugless school is recognized by the Association. That the diploma from Rush Medical College is fraudulent is indicated in infor-

mation from the school pointing out the discrepancies between it and authentic credentials. Investigations are being continued by the California Board of Medical Examiners.

FLORIDA

Examination of School Children.—Physical examination of all the school children in Hillsborough County was to have begun early in November, according to newspaper reports. Under arrangements worked out by the county school board, parents will be informed of the physical defects of the children.

State Hospital Overcrowded.—A recent executive order forbade the acceptance of any more patients at the state hospital at Chattahoochee until the extreme crowding was relieved, according to newspapers. In an attempt to relieve the congestion, the discharge of about 100 senile patients to their relatives was being considered.

Society News.—Dr. Leigh F. Robinson, Fort Lauderdale, has been elected president of the Florida East Coast Medical Society, and Dr. Spencer A. Folsom, Orlando, secretary. The next annual meeting will be held in Orlando.——At a meeting of the Midland Medical Society, October 26, Dr. Thomas M. Rivers, Kissimmee, was named president, and Dr. James R. Boulware, Jr., Lakeland, secretary.

ILLINOIS

Personal.—Dr. William E. Buxton, West Salem, observed his seventy-fifth birthday, recently. Dr. Buxton has been practicing medicine for fifty years.——Dr. and Mrs. Charles D. Gardiner, Grand Tower, celebrated their golden wedding anniversary, October 11.

Chicago

Dr. Hesseltine Awarded Prize.—Dr. Henry Close Hesseltine, instructor in obstetrics and gynecology, Division of Biological Sciences, University of Chicago, was awarded the annual prize of $100 by the Central Association of Obstetricians and Gynecologists for the most meritorious work done by one of its members. This is the second time Dr. Hesseltine has won the prize, this year for his research on "Trichomonas Vaginalis Vaginitis," and last year for a paper on "Gynecologic Fungi Infections in Diabetic Patients."

Society News.—The Society of Medical History of Chicago was addressed, November 23, by Drs. James B. Herrick on "Allan Burns: Anatomist, Surgeon, Cardiologist, 1781-1813," and by Hugh T. Patrick on "Three Great Neurologists I Have Known."——Speakers before the Chicago Neurological Society, November 16, included Drs. Paul C. Bucy on "Ipsilateral Representation in the Motor and Premotor Cortex" and Mabel G. Masten, Madison, Wis., "Neurogenic Ulcers in Cerebral Lesions (Cushing's Syndrome)."——At a meeting of the McDonagh Society for Clinical Research, November 17, among others, Drs. Ernst Pribram and Stanley Fahlstrom spoke on "Studies in Arthritis and Arthrosis."——The Chicago Pediatric Society was addressed, November 21, by Drs. George Piness, Los Angeles, on "Food Factors in Allergy of Childhood," and Louis W. Sauer, "Whooping Cough Immunization."——Dr. Ernst Kraas, University of Frankfort, Germany, spoke before the Physiology Journal Club, Northwestern University Medical School, November 16, on "Choice of Operation in the Surgery of the Stomach and Gallbladder."——Dr. William G. Rogers, among others, addressed the Chicago Gynecological Society, November 17, on "Rupture of the Fetal Liver," and Drs. Beatrice E. Tucker and Harry B. W. Benaron on "Parasacral Anesthesia in Obstetrics." Dr. Fred L. Adair was elected president.——The health division of the Council of Social Agencies was addressed at its annual meeting, November 9, by Drs. Frank J. Jirka, state health officer; Frederick Tice of the Municipal Tuberculosis Sanitarium, and Frederick O. Tonney of the Chicago Board of Health.

INDIANA

Hospital News.—The William Ross Memorial Sanatorium, Lafayette, opened its fourth annual short course on tuberculosis, October 24, with Dr. Walter H. Mytinger, superintendent, giving the opening address. Other speakers included Drs. Willis D. Gatch, dean, Indiana University School of Medicine, Indianapolis, and Kennon Dunham, Cincinnati.

Society News.—Dr. Howard L. Stitt, Cincinnati, addressed the Dearborn-Ohio County Medical Society in Lawrenceburg, October 26, on "Bronchoscopic Lavage."——At a meeting of the Jasper-Newton County Medical Society, October 28, Dr. John H. Warvel, Indianapolis, discussed the importance of the laboratory in diagnosis of disease.——Dr. Cyrus C. Sturgis, Ann Arbor, Mich., conducted a seminar on anemia before the Elkhart County Medical Society, November 2.

IOWA

Report of Committee on the University Hospitals.—A committee of nine, headed by Dr. Elbert E. Munger, Spencer, was appointed last March by the legislature to investigate the causes and suggest remedies for the waiting list of indigent patients committed but not admitted to the University Hospitals in Iowa. The committee recently submitted a report to the legislature, convened in extra session. The list of waiting patients grew from sixteen, Sept. 1, 1927, to 5,238 on Feb. 7, 1933. During the year ended June 20, 1932, there were 8,719 patients admitted to the University Hospitals, with an average hospitalization period of 17.7 days. There was an average daily number of patients in the hospitals of 4,926. The university is said to graduate each year twenty medical practitioners more than are actually required to care adequately for the sick. The establishment of suitable entrance requirements to reduce the average annual number of graduates to seventy-five was urged. This would reduce the amount of teaching material needed and thereby decrease the expenses of the medical school to the state. Admission to the University Hospitals is now governed by the quota plan, which provides that committed patients be admitted to the hospitals in proportion to the population of the counties of their residence instead of, as the laws seem to contemplate, in proportion to the number of commitments. The committee of nine believes that this procedure will ultimately retard the admission of adequate material for the instruction of medical students, since the supervisors might preserve their quota by committing patients requiring a long period of care and provide for the treatment of accident and obstetric cases and those of acute illness in their home communities. In its recommendations, the committee urges that half the basic cost of hospitalization of indigents be charged to the counties of their residence, an adequate investigation to be made under the direction of the county board of supervisors before commitment to determine indigence. In this attempt to reduce the number of patients, the reduction should be made selective so that clinical material needs will not be jeopardized and so that the admission of patients who can be best treated there will not be delayed. The reduction of a physician's examination fee from $5 to $3 and the escort's wages from $3 per day to $2 is recommended. Principal recommendations of a minority report, not yet submitted, urge the removal of the medical college from Iowa City to Des Moines and advocate the repeal of the adult indigent law. Members of the committee of nine are Dr. Oliver J. Fay, Des Moines; Dr. Walter A. Sternberg, Mount Pleasant; Dr. Arthur W. Erskine, Cedar Rapids, secretary; Senator G. W. Patterson, Burt; Senator E. R. Hicklin, Wapello; Senator Morris Moore, Walnut; Paul L. Millhone, Clarinda; Representative John Speidel, Washington, and Dr. Munger. These men were appointed by the governor, president of the senate, and speaker of the house of representatives.

KANSAS

Society News.—Dr. Claude C. Tucker, Wichita, discussed "Anal Fistula and Rectal Abscess" before the Butler-Greenwood County Medical Society in Augusta, October 13.——The Sedgwick County Medical Society devoted its meeting, November 21, to a symposium on lesions of the hip, their diagnosis and cure; the speakers were Drs. Arthur E. Bence, Edwin D. Ebright and Charles R. Rombold, all of Wichita.

LOUISIANA

Protest Enlargement of Charity Hospital.—Representatives of six independent hospitals of New Orleans adopted a resolution, November 3, protesting against the erection of a new twenty-six story building for Charity Hospital, mainly because the proposed plans call for the treatment of pay or part pay patients other than patients suffering from contagious diseases. The board of administrators of Charity Hospital is reported to have applied to the federal public works committee of Louisiana for an allotment of $9,600,000 for this purpose. The resolution points out that, since the independent hospitals of New Orleans are charitable in purpose and not operated for profit, the inclusion of this service in Charity Hospital would be an invasion into the province of their services, as well as an unprecedented departure from the recognized functions of a state charity hospital. The decentralization of hospital care for indigent patients and provision for their care in smaller hospitals at focal points in the state would permit a decrease in the capacity of the present Charity Hospital, the resolution states, while, if they were subsidized, independent institutions in New Orleans could care for at least 400 more indigent patients. Copies of the resolution were sent to the

Federal Public Works Board of Louisiana, board of administrators of Charity Hospital, proper departments in Washington, D. C., Orleans Parish Medical Society, Louisiana State Medical Society, the daily press, Louisiana and American hospital associations, and the *New Orleans Medical and Surgical Journal*. The institutions represented in the resolution were Southern Baptist and French hospitals, Flint Goodridge Hospital of Dillard University; Hotel Dieu, Mercy Hospital-Soniat Memorial and Touro Infirmary. A resolution, embodying similar objections, was adopted by the Calcasieu Parish Medical Society.

MASSACHUSETTS

Society News.—Dr. Winfred Overholser, assistant commissioner of the state department of mental diseases, was elected president of the Massachusetts Psychiatric Society at its recent annual meeting, succeeding Dr. Morgan B. Hodskins, Palmer. ——Dr. William D. McFee, Boston, spoke before the Lawrence Medical Club, October 18, in Lawrence, on "Physiotherapy in Relation to General Practice."

George W. Gay Lecture.—Dr. Robert B. Osgood, John B. and Buckminster Brown professor of orthopedic surgery, emeritus, Harvard Medical School, Boston, gave the George W. Gay Lecture on Medical Ethics at the school, November 2; his subject was "The Theology of Medicine." Dr. John Homans, assistant professor of surgery, spoke, November 9, on "The Care of the Patient," and Dr. Elliott P. Joslin, clinical professor of medicine, discussed the same subject, November 16.

MICHIGAN

Society News.—A symposium on the treatment of fibroid tumors and bleeding during the menopause was presented before the Wayne County Medical Society, Detroit, November 13, by Drs. John T. Murphy, Toledo, and Jean P. Pratt and George A. Kamperman, Detroit. A symposium on peptic ulcer was given before the society, November 20, with Drs. Patrick L. Ledwidge, Osborne A. Brines, Clyde E. Vreeland, George E. McKean, all of Detroit, and Ambrose L. Lockwood, Toronto, as the speakers.——The Detroit Obstetrical and Gynecological Society was addressed, November 7, by Drs. Charles E. Boys, Kalamazoo, on "Rôle of Supravaginal Hysterectomy in Gynecology, with Motion Picture Illustration of Author's Technic," and Howard H. Cummings, Ann Arbor, "Weight Changes During Pregnancy."——At a meeting of the Detroit Pediatric Society and the American Academy of Pediatrics, December 6, Dr. Louis H. Newburg, Ann Arbor, will speak on nutrition.

Conference on Preventive Medicine.—The establishment of whole time county health departments and the extension of preventive medical procedures into the offices of all cooperating physicians were the subjects of discussion at a state conference of the committee on preventive medicine of the Michigan State Medical Society in Detroit, November 15. Discussing these subjects were Drs. Henry A. Luce, speaker, house of delegates, state medical society; Stuart Pritchard of the Kellogg Foundation, Battle Creek; Louis J. Hirschman, state advisory council; James D. Bruce, University of Michigan Medical School, Ann Arbor; Bruce C. Lockwood, Wayne County Medical Society; Albert M. Wehenkel, and Henry F. Vaughan, Dr.P.H., health commissioner of Detroit. Conferences on communicable diseases and tuberculosis were held in the morning. During the day, the public health committee of the Wayne County Medical Society demonstrated how it serves to coordinate and supervise the health services which are a joint concern of the organized medical society and the department of health. The participation of cooperating physicians was shown by the East Side Medical Society of Detroit, and the W. K. Kellogg Foundation demonstrated its application of the medical participation plan in Barry, Eaton and Allegan counties, where conditions are typically rural.

MINNESOTA

Society News.—Speakers before the Hennepin County Medical Society, November 1, were Drs. Walter J. Marcley and Jay Arthur Myers, Minneapolis, on diagnosis of tuberculosis and pneumothorax, respectively; November 6, Dr. John S. Lundy, Rochester, special methods of anesthesia; November 8, Drs. Harold S. Diehl and Frederic C. Rodda, Minneapolis, medical treatment of the common cold and the acute cold in infancy, respectively. Dr. Louis M. Warfield, Milwaukee, will address the society in Minneapolis, December 4, on "Does the Heart Fail in Acute Infection?" The society heard Leroy S. Palmer, Ph.D., professor of agricultural biochemistry, University of Minnesota, speak on the chemistry of foods, with special reference to malnutrition and obesity; Drs. James B. Carey and Chauncey A. McKinley discussed malnutrition and obesity, respectively.——The Minnesota Academy of Medicine was addressed, November 8, by Drs. Arthur E. Smith, Minneapolis, and Alexander R. Colvin, St. Paul, on "The Eye in Cardiovascular Disease" and "Experiences in Surgery of the Colon," respectively.

NEBRASKA

Society News.—Dr. Leonard J. Owen, among others, addressed the Lancaster County Medical Society, Lincoln, October 17, on "Allergic Manifestations of the Skin."——At the October meeting of the Madison Six County Medical Society in Norfolk, Drs. Abram E. Bennett and Leon S. McGoogan, Omaha, spoke on epidemic encephalitis and purpura in pregnancy, respectively.——Harry N. Boyne, D.D.S., Council Bluffs, and Dr. Richard Young, Omaha, addressed the November meeting of the Otoe County Medical Society, Nebraska City, on "Early Diagnosis and Eradication of Oral Pathology" and "Pernicious Anemia: Neurologic Complications and Treatment," respectively.——Drs. Ira H. Dillon and Ernest H. Decker, Topeka, Kan., among others, addressed the autumn meeting of the Third Councilor District Medical Society, Humboldt, October 19, on "Interpretation and Treatment of Subjective Eye Symptoms" and "Diagnosis and Treatment of Common Skin Diseases," respectively.——A symposium on pneumonia was presented before the Omaha-Douglas County Medical Society, November 14, by Drs. Frank M. Conlin, Joseph A. Weinberg, Howard B. Hunt, Wilson B. Moody, Abraham S. Rubnitz and James P. Tollman.

NEW JERSEY

Society News.—Dr. Howard Fox, New York, addressed the Bergen County Medical Society, October 10, on "Diagnosis and Treatment of Some Common Skin Diseases," and the county medical relief plan was discussed.——Dr. Benjamin F. Buzby, Camden, addressed the Gloucester County Medical Society, Pitman, September 21, on osteomyelitis.

Cancer Week in Newark.—Exhibits and lectures on cancer for both the medical profession and the public, December 5-7, will mark the observance of Cancer Week by the Essex County Medical Society in Newark at the Academy of Medicine of Northern New Jersey. At a public meeting the evening of December 5, speakers will be Drs. Jonathan M. Wainwright, Scranton, Pa., chairman of the cancer commission of the Medical Society of Pennsylvania, on "What Has Been Done and What Can Be Done in Cancer Control"; Edward J. Ill, Newark, "Progress of Our Cancer Knowledge," and William H. Areson, Upper Montclair, "Reasons for Cancer Control." The regular meeting of the county society will be held, December 7, with Dr. Harrison S. Martland, medical examiner of Essex County as the speaker, on the present status of theories of the cause of cancer and on metastasis. About fifty exhibits will be presented by individual physicians and eighteen by hospitals.

Annual Health Review.—Death rates for tuberculosis, typhoid and diphtheria and infant mortality reached new low records for New Jersey during the year ended June 30, 1933, according to *Public Health News* for October. The rate for diphtheria was 0.02 per thousand of population; for typhoid, 0.006, and for tuberculosis, 0.6. The infant mortality rate was 50. A new law regulating production and handling of milk products was put into effect during the year and minimum standards of sanitation for roadside food stands and similar places were adopted. The first year under a law requiring dog bites to be reported to local health authorities brought records of 7,809 persons bitten. Among the dogs were 222 affected with rabies; three of the victims died. Laboratory service was greatly increased during the year, according to the report. A 57 per cent increase in the number of samples of water and sewage tested was reported. More than 41,000 Wassermann tests were made. A new law places on the department the duty of licensing barbers and inspecting barber shops.

NEW MEXICO

State Health Survey.—Carl Buck, Dr.P.H., field representative of the American Public Health Association, is beginning a health survey of New Mexico under the auspices of the New Mexico Tuberculosis Association. The survey has been endorsed by the New Mexico Medical Society and other health organizations, and the U. S. Bureau of Indian Affairs and the American Social Hygiene Association are cooperating in the work. Dr. Walter J. Clarke, New York, of the latter organization has begun work on the social hygiene aspects. A one-day census of venereal disease under treatment is to be made, December 1, with the cooperation of the U. S. Public Health Service.

NEW YORK

District Meeting.—The annual meeting of the Second District Branch of the Medical Society of the State of New York was held in Garden City, November 16. A symposium on acute conditions in the abdomen was presented from the points of view of the surgeon by Drs. John E. Jennings, Brooklyn, and James Wesley Bulmer, Glen Cove; the internist, by Drs. Carl Boettiger, Long Island City, and Irving Gray, Brooklyn; the gynecologist, by Dr. Charles A. Gordon, Brooklyn; the urologist, by Dr. James W. McChesney, Baldwin; the neurologist, by Dr. Orman C. Perkins, Brooklyn, and the pediatrician, by Dr. Miner C. Hill, Oyster Bay. Dr. William W. Bauer, director, Bureau of Health and Public Instruction, American Medical Association, Chicago, gave an address at the evening banquet on control by the medical profession of the practice of preventive medicine.

New York City

Second Harvey Lecture.—William Mansfield Clark, Ph.D., De Lamar professor of physiologic chemistry, Johns Hopkins University School of Medicine, Baltimore, delivered the second Harvey Lecture at the New York Academy of Medicine, November 16, on "The Potential Energies of Oxidation-Reduction System and Their Biochemical Significance."

Hospital News.—A symposium on medical education was presented at Mount Sinai Hospital, November 6, by Drs. G. Canby Robinson, John H. Wyckoff, Jr., and Willard C. Rappleye.——Beth Israel Hospital and the Jewish Maternity Hospital have merged to form what will be known as the Beth Israel Medical Center. Maternity Hospital is to have a new building adjacent to the comparatively new building of Beth Israel.

Dr. Welch Retires as President of Rockefeller Board.—Dr. William H. Welch, Baltimore, president of the board of scientific directors of the Rockefeller Institute for Medical Research since it was founded in 1901, has retired. He was elected member emeritus of the board, a new office. Dr. Welch is now 83 years old. Dr. Theobald Smith, Princeton, N. J., director emeritus of the department of animal pathology of the institute, succeeded Dr. Welch.

Society News.—The section on orthopedic surgery of the New York Academy of Medicine held a joint meeting with the Orthopedic Club of Philadelphia, November 17; Drs. Arthur Bruce Gill and James T. Rugh, Philadelphia, presented papers on "Treatment of Intracapsular Fractures of the Neck of the Femur" and "Injurious Effects of Menstruation on Inflammatory Joint Processes," respectively.——Dr. Francis Carter Wood addressed the New York Roentgen Society, November 20, on "Recent Studies on the Etiology of Cancer."——A symposium on gastric neoplasms was presented at a joint meeting of the section on surgery of the New York Academy of Medicine with the New York Pathological Society, November 23, by Drs. Arthur Purdy Stout, Ross Golden and Fordyce B. St. John.——Dr. Nathan B. Van Etten addressed the Medical Society of the County of Queens, October 31, on "Problems of the Young Physician."——A round table conference on diabetes mellitus made up the program of the Medical Society of the County of New York, October 30; speakers were Drs. Rollin T. Woodyatt, Chicago; Priscilla White, Boston, and Herman O. Mosenthal and Henry Rawle Geyelin, New York.

OHIO

Charity Surgical Treatment Limited to Emergencies.—The council of the Toledo Academy of Medicine at a recent meeting passed a resolution recommending a limitation of staff service in Toledo hospitals to acute emergency operative cases during the economic depression. The matter was referred to the academy's hospital relations committee, which endorsed the council's policy and recommended that any physician who did not adhere to the spirit of the decision be requested to resign from the academy. The eye, ear, nose and throat section of the society almost unanimously signed a pledge to do no more "routine" but only emergency surgery in the hospital clinics.

PENNSYLVANIA

Society News.—A symposium on cancer was presented at the meeting of the Dauphin County Medical Society, Harrisburg, November 7, by Drs. Justin Loomis Christian, Park A. Deckard, Harvey F. Smith, William M. Kunkel and George R. Moffitt.——The Western Pennsylvania Eye, Ear, Nose and Throat Society was organized at a meeting in Indiana, October 19; Drs. George M. Coates, Philadelphia, and George H. Shuman, Pittsburgh, addressed the meeting on sinus disease and slit lamp microscopy, respectively.——Drs. Charles Geschickter and Murray M. Copeland, Baltimore, addressed the Fayette County Medical Society, Uniontown, November 2, on tumors.

Advisory Committees.—The mayor of Pittsburgh some months ago appointed an advisory committee on health problems, which has now outlined its program of study and chosen subcommittees (THE JOURNAL, May 13, p. 1549). The problems selected for study and the chairmen of committees are: air hygiene, Dr. Samuel R. Haythorn; venereal disease control, Dr. Charles B. Schildecker; water control, C. F. Drake, superintendent of the filtration plant; Negro health, Dr. George E. Martin; housing survey, Mr. Charles F. Lewis, director of the Buhl Foundation; preschool child health, Dr. Carl K. Wagener; municipal waste disposal, and squatter control. Committees for the last two subjects named have not been announced.

Philadelphia

Hospital News.—A new unit of the Philadelphia Skin and Cancer Hospital was opened, October 5. Dr. Albert Strickler is medical director.——The federal public works administration has allotted $2,250,000 for completion of the Naval Hospital. It is now about one third finished.

Society News.—The program of the Philadelphia County Medical Society, November 22, was devoted to consideration of minor surgical conditions met by the general practitioner. Speakers were Drs. Eldridge L. Eliason, on "Finger Infections"; Edward T. Crossan, "Acute Ankle Sprains," and George P. Muller, "Cervical Adenitis."——Dr. Myer Solis-Cohen, among others, addressed the Philadelphia Pediatric Society, November 14, on "Acute Interstitial Pneumonia: A Peculiar Form Not Mentioned in Textbooks," with report of eight cases.

TEXAS

Directory of Licensed Physicians.—The Texas State Board of Medical Examiners has published a directory of all licensed physicians in the state as of October 1. It is planned to publish such a list each year, according to Dr. Thomas J. Crowe, Dallas, secretary of the board. The booklet is available for 25 cents per copy, to cover cost of printing and mailing.

District Meeting.—The Northwest Texas District Medical Society and the Fort Worth Medical and Surgical Clinics held a joint meeting in Fort Worth, October 10-11. Clinics were held at St. Joseph's, Methodist and the City-County hospitals and addresses were given, among others, by Drs. William B. Carrell, Dallas, "Prevention of Deformity Following Poliomyelitis"; John Harolde Turner, Houston, "Prostatic Resection: Indications and Limitations," and George V. Brindley, Temple, "Complications of Peptic Ulcer." Drs. Bransford Lewis, St. Louis, and Paul M. Bassel, Temple, made addresses at an evening banquet on "Vocations and Avocations of the Doctor" and "Narcolepsy," respectively.

Society News.—Drs. Charles W. Stevenson, Wichita Falls, and Roy L. Fisher, Frederick, Okla., addressed the Wichita County Medical Society in Wichita Falls, September 12, on epidemic encephalitis and sacrococcygeal tumors, respectively.——Dr. Thomas H. Cheavens, Dallas, addressed the Ellis County Medical Society, Waxahachie, in September, on the brain and the nervous system.——Drs. Edward H. Schwab, Jr., Galveston, and Samuel D. Weaver addressed the Dallas County Medical Society, October 24, on treatment of craniocerebral injuries and hypertension, respectively.——Dr. Philip C. Jeans, Iowa City, was guest speaker at a meeting of the Texas Pediatric Society, October 28, in San Antonio, on "Practical Aspects of Nutrition in Childhood."——Dr. Quitman U. Newell, St. Louis, addressed the Texas Association of Gynecologists and Obstetricians at San Antonio, recently, on advances in the management of sterility, and the Harris County Medical Society, Houston, on the prevention of uterine cancer.——Dr. Alfred I. Folsom, Dallas, was elected president of the Texas Surgical Society at its semiannual session in Fort Worth, October 16-17. Dr. Hugh H. Trout, Roanoke, Va., was a guest speaker on "Modern Methods of Surgery to Relieve Adhesions Around the Heart."

WEST VIRGINIA

Society News.—Dr. Charles Geschickter, Baltimore, addressed the Ohio County Medical Society, Wheeling, November 3, on "Tumors of the Breast." Dr. Louis H. Clerf, Philadelphia, spoke, November 17, on "Diagnosis and Treatment of Pulmonary Abscess and Bronchiectasis."——Dr. William R. Laird, Jr., Montgomery, addressed the Fayette County Medical Society, Oak Hill, October 10, on etiology and pathology of acute appendicitis.——At a joint meeting of the Parkersburg Academy of Medicine and the Cabell County Medical Society

in Parkersburg, October 5, Drs. Frank C. Hodges and John H. Steenbergen, Huntington, discussed sudden cardiac deaths and office practice of gynecology, respectively.——Dr. Arthur E. McClue, state health commissioner, addressed the Mercer County Medical Society, Bluefield, October 26, on problems of public health work in relation to private practice of medicine.

GENERAL

Physical Therapy as Related to Proctology.—A committee has been organized by the American Proctologic Society to investigate the status of physical therapy as it applies to proctology. Dr. Herbert I. Kallet, Detroit, has been named chairman, and other members of the committee include Drs. Harry Z. Hibshman, Philadelphia; Emmett H. Terrell, Richmond, Va.; E. Jay Clemons, Los Angeles, and Frank C. Yeomans, New York.

Conference on Birth Control and National Recovery.—A three day conference on birth control and national recovery will be held in Washington, January 15-17, under the auspices of the National Committee on Federal Legislation for Birth Control. The preliminary program lists the following subjects for discussion: population problems, religion and moral questions, the family and community welfare, health and economic recovery, contraceptive technic and standards, birth control clinics and federal legislation.

Change of Status in Licensure.—The Georgia State Board of Medical Examiners reports the following:

Dr. William A. Starnes, Atlanta, license revoked, October 12, for violation of the Harrison Narcotic Act.

The State Board of Health of Kentucky reports the following action:

License of Dr. Earle J. Brashear, North Pleasureville, revoked for violation of the Harrison Narcotic Act.

The Colorado State Board of Medical Examiners reports the following action:

Dr. Taber A. Darling, Fort Lupton, license revoked, October 3, for the unlawful sale of narcotics.

The California State Board of Medical Examiners reports the following action:

Dr. Rudolf F. Rohlfing, Los Angeles, license revoked, following a hearing on charges that he practiced under a name other than his own. Dr. Rohlfing was connected with the Special Cancer Clinic in Los Angeles.

Neuropsychiatric Meeting.—The Central Neuropsychiatric Association held its annual meeting in Cleveland, October 13-14, at the Cleveland Clinic and the Lakeside Hospital, where Cleveland members demonstrated their clinical and research facilities and activities. Among the presentations were:

Dr. Wallace B. Hamby, Tumors of the Spinal Canal in Childhood.
Dr. Ursus V. Portmann, X-Ray Treatment of Brain Tumors.
Dr. John H. Nichols, Congenital Cerebral Atrophy.
Dr. Richard E. Stout, Psychoses of Myxedema.
Dr. James D. Pilcher, Erythroblastosis Neonatorum Showing Kernicterus.
Dr. Albert T. Steegmann, Recent Contribution to the Histopathology of Epilepsy.
Dr. Samuel C. Lindsay, Neuropsychiatric Trends.

Dr. Hans H. F. Reese, Madison, Wis., made his address as retiring president at the annual dinner and Dr. T. Wingate Todd, Cleveland, spoke on "Neuropsychologic Expressions of Infantile Disorders." Dr. H. Douglas Singer, Chicago, was elected president and Dr. Henry W. F. Woltman, Rochester, Minn., secretary.

Decrease in Number of County Health Units.—According to *Public Health Reports* in a discussion of full time health service in rural areas during the period Jan. 1, 1932-Dec. 31, 1932, a net loss of thirty-five full time health units was recorded during the year, when this service was established in nine units and discontinued in forty-four. The largest gain in one state was that of four units in Michigan, while the greatest loss was sustained in Oklahoma, where all nine counties in the state having this service discontinued it. Delaware led in the percentage of rural population under full time health service, all three of its counties having been provided with local full time health organization by the state. Of the states in which the local governmental units maintain the health organizations, with or without assistance from the state health department or other sources, Maryland had the highest percentage (95.3) of rural population under full time health service. Of the 581 counties, townships or districts with full time health service, 551, or 94.8 per cent, were receiving financial assistance from one or more of the following agencies: the state board of health, the U. S. Public Health Service, the Rockefeller Foundation, the American Red Cross, the American Women's Hospital Fund, the Rosenwald Fund, the Commonwealth Fund and the Milbank Fund. On Dec. 31, 1932, there were twelve states which did not have local full time health service.

Medical and Surgical Association of the Southwest.—The nineteenth annual meeting of the Medical and Surgical Association of the Southwest will be held in El Paso, Texas, December 7-9, at the Hotel Hussman. Discussions for the first day will be on allergy; for the second, on tuberculosis, and for the third, on goiter. Among physicians who will deliver addresses are:

Orville H. Brown, Phoenix, Ariz., Food Allergy.
Redford A. Wilson, Tucson, Ariz., Hay Fever.
James E. Sherman, El Paso, Allergy in Tuberculosis.
Warner Watkins, Phoenix, Chronic Inflammation in the Lungs with Special Reference to Silicosis.
John Rosslyn Earp, Santa Fe, N. M., Childhood Tuberculosis as a Public Health Problem.
Charles W. Mills, Tucson, Treatment of Cavities.
Stirley C. Davis, Tucson, Hypothyroidism.
John W. Cathcart, El Paso, X-Ray and Radium Treatment of Exophthalmic Goiter.
Gottlieb Werley, El Paso, The Heart in Thyroid Disease.

Dr. Martin B. Tinker, Ithaca, N. Y., will be the guest speaker, on "Tuberculosis and Malignancy of the Thyroid." Thursday evening, December 7, there will be a clinical demonstration at William Beaumont General Hospital and the annual dinner will be held Friday evening, when Dr. Walter A. Gekler, Albuquerque, N. M., the incoming president, will make his official address.

CANADA

Officers of Medical Council.—Dr. Robert H. Arthur, Sudbury, Ont., was recently elected president of the Medical Council of Canada, succeeding Dr. W. A. Thomson, Regina. Dr. Walter S. Galbraith, Lethbridge, Alta., was elected vice president and Dr. John Fenton Argue, Ottawa, registrar.

Personal.—Dr. Robert E. Wodehouse, Ottawa, has been appointed deputy minister of pensions and national health. Dr. Wodehouse was at one time a district medical officer of health in Ontario and was recently executive secretary of the Canadian Tuberculosis Association. He succeeds Dr. John A. Amyot.

Neurological Institute at McGill.—The governor general of Canada, Lord Bessborough, laid the cornerstone of the new Neurological Institute at McGill University, Montreal, at the annual ceremonies on Founder's Day, October 6, the birthday of James McGill. Various donors have provided the fund for building of the institute, the largest among them being the Rockefeller Foundation, which contributed $1,232,652. Dr. Wilder G. Penfield, professor and head of the department of neurology at the university faculty of medicine, is to be head of the institute (THE JOURNAL, June 18, 1932, p. 2220).

Society News.—Dr. Ernest L. Garner, Vancouver, B. C., addressed the Vancouver Medical Association, October 3, on fractures, and Dr. Frederic J. Brodie, November 7, on injuries to the brain.——Dr. James C. McMillan, Winnipeg, was elected president of the Manitoba Medical Association at the annual meeting in Winnipeg, September 7-9. Guest speakers included Drs. Roscoe R. Graham, Toronto, on "Surgical Therapy in Biliary Disease" and John C. Meakins, Montreal, "Bronchiectasis and Its Treatment."——Dr. Thomas A. Ledbetter, Yarmouth, was elected president of the Nova Scotia Medical Society at the annual meeting in Halifax, September 5-6.

Government Services

Federal Malaria Control

Ten million dollars will be expended in the federal program of malaria control to be launched by the U. S. Public Health Service this month, it is reported. The work will be carried on in twelve states: Florida, Arkansas, Alabama, Louisiana, the southeastern portion of Missouri, Mississippi, North Carolina, South Carolina, Georgia, Tennessee, Texas and Virginia. Dr. Thomas H. D. Griffitts, who has been conducting a preliminary survey in Florida for the past year, will supervise the campaign, which is planned to begin in the counties of western Florida. The plan, approved by the Federal Emergency Relief Administration, provides that, while the public health service will cooperate in technical direction and will detail medical and engineering officers for duty in the states, each state department of health is ultimately to assume direction of the work. Surveys conducted by Dr. Griffitts in eight of the most heavily infected counties in Florida reveal that more than 5 per cent of the 10,000 school children examined have shown malarial infection, this number not including those who were actually suffering from acute attacks of malarial fever.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Nov. 4, 1933.

The Control of Measles

The London County Council, which now controls almost all the hospitals for infectious diseases in the metropolis, has issued a comprehensive report on the measles epidemic of 1931-1932, in which is shown the value of the recently introduced serum treatment both as a prophylactic agent and in the attenuating of attacks. About six years ago, several animal serums were available for the treatment of measles. A trial of three of these was made and the results were compared with those of the serum of human convalescents in preventing the disease. Injection of the three animal serums into susceptible "contacts" was followed by the development of measles in 57, 60 and 100 per cent of the cases, respectively, while injection of human convalescent serum was followed by measles in only 4.3 per cent. As a result of these experiments the use of animal serum was abandoned in the London fever hospitals and it obtained no vogue in this country. The haphazard way in which various so-called immune serums have been administered in measles prophylaxis on the European continent is open to criticism. On the one hand, sufficient care is rarely taken to ascertain whether effective exposure to measles has taken place or whether the patient has had a previous attack, and, on the other hand, control experiments are usually inadequate or are omitted altogether. In the earlier experiments in London, alternate contacts of approximately the same age, who occupied beds at similar distances from the infecting patient, were inoculated with doses adjusted to body weight, but even then unexpected and uneven results were encountered, depending on such variables as different bed spacing, season, duration of the exposure, degree of catarrh in the primary case, and nursing efficiency. To insure a sufficient margin of safety a dosage scheme more generous than that recommended by most continental and American workers was adopted. A minimum injection of 5 cc. of serum was given, and from three years onward the dose was reckoned in cubic centimeters by multiplying the age in years by 2. This increased dose was given to overcome the occasional discrepancy between body weight and age, as probably the final concentration of antibodies in the circulation is the factor that determines success. The injections were given intramuscularly as soon as possible after the contact, certainly before the sixth day, if complete protection was desired. If attenuation was aimed at, the same dose was given between the sixth and the ninth day, or half the dose was injected in the first five days, with similar results and economy in the use of serum. With the doses mentioned, complete protection resulted in the last hundred prophylactic inoculations.

POOLED ADULT SERUM

As adequate supplies of convalescent serum were not available when needed most, a supply of pooled adult serum was organized and its value ascertained. An appeal for blood was made to the medical and nursing staffs of the council's hospitals. Great care was taken to make certain that the history of a previous attack of measles was authenticated. Nevertheless from 3 to 5 per cent of the donors had never had the disease. On the other hand, as they were actively engaged in infectious disease work and subject to contact with measles patients, the antibody content of their blood was probably above the average. Comparison was made between 1,475 cases in which adult serum was injected and 680 cases in which convalescent serum was injected. The figures were analyzed by an expert statistician, Mr. W. T. Russell, of the department of statistics at the London School of Hygiene and Tropical Medicine. Convalescent serum was found to be a more powerful prophylactic than adult serum for each age group, but the difference was of statistical significance only in respect to children under the age of 5 years and was greatest in the age group of 1 to 3 years, at which period susceptibility is highest. After the age of 5 years there was nothing to choose between the two serums.

It was found that protection could almost certainly be obtained if, during the first three days after exposure, 4 cc. of adult serum or 2 cc. of convalescent serum, multiplied by the age of the child, was injected intramuscularly, with minimum doses of 10 cc. and 5 cc., respectively. Attenuation was more problematic. If these doses were given from the sixth to the ninth day, attenuation followed in only about a third of the cases and prevention in the remainder, excepting less than 1 per cent, who were unaffected. Approximately the same attenuation, with proportionate economy, was attained from half doses given before the sixth day. More work is required to ascertain the dosage most likely to produce attenuation. Attenuation has the advantage that, however mild and fleeting the attack of the disease, permanent immunity follows; whereas, if the disease is entirely prevented, the immunity lasts only a few weeks.

Sugars Made in the Laboratory

Addressing the British Association of Chemists, E. C. C. Baly, professor of inorganic chemistry in the University of Liverpool, made the stupendous announcement that by the action of light, as in the living plant, he had produced sugars in the laboratory. The process consisted of two parts: the photochemical conversion of carbonic acid into what might be called active formaldehyde, and the polymerization of the formaldehyde into sugars. The proof of the formation of the sugars by photosynthesis in the laboratory was complete. This was achieved with nickel carbonate (which when irradiated by light was converted into nickelic oxide and active formaldehyde), a process exactly analogous to that of the living plant. Other workers had failed to confirm the successful results obtained at Liverpool, and this could be explained. If impurities were present in the first of the two stages effected by light, the substance produced reverted to carbonate as fast as it was formed. Photosynthesis had also been achieved by the irradiation of cobalt carbonate, and the proof of that phenomenon was free from any doubt. The two-stage theory of activation thus reached offered a satisfactory explanation of all the heretofore unexplained observations made with living plants.

The Indian Medical Service Endangered

The desire of the British government to give self government to India has encountered great difficulty in consequence of the action of Indian extremists, who, notwithstanding the benefits of British rule, are fanatically hostile to any British rights whatever. In a previous letter the desire to exclude British physicians from practicing in India was shown. Great concern is now felt for the greatest colonial medical service in the world, the Indian Medical Service, which not only introduced European medicine into India but founded medical schools there and played a great part in the creation of tropical medicine. The British Medical Association has prepared a memorandum for submission to the India Select Committee (which is working out the scheme of self government for India) expressing the view that disintegration of the Indian Medical Service is bound to follow the proposals made. It will cease to attract physicians of the highest attainment. The main contentions of the association are that: 1. Successful recruitment of the service cannot be maintained if the civil branch of the service is discontinued. (This refers to the fact many of the prizes of the service are civil medical appointments.) 2. The scheme for employing

British physicians for contract service in the respective provincial medical services will not be useful. 3. Medical provision in India, including administration, teaching and public health, should include a due proportion of British personnel. 4. The women's medical service should be expanded and should include a due proportion of British medical women for teaching, administration and research. It is further pointed out that under the proposals a military reserve of British physicians would not be available in time of emergency or war; also that adequate medical attendance on British officers and their families by British physicians would not be insured.

Tubercle Bacilli in the London Milk Supply

An important report on the milk supply of London has been made to the central public health committee of the London county council. An entirely new position has arisen from the practice adopted in recent years of receiving country milk at depots, where it is bulked and transported to London in large glass-lined tanks, each holding about 3,000 gallons. As these tanks contain milk from many different herds, the addition of tuberculous milk from one farm infects the whole. The first examination of ten road and rail tanks showed that all contained living virulent tubercle bacilli. The results of the examination of London milk show that in the prewar period from 1907 there was a steady decline in samples found to be tuberculous from 11.6 to 7.9 per cent. In the earlier war period the percentage continued to fall but rose again in 1916 and attained a maximum about equal to that of the prewar period. Then it fell rapidly for a decade and reached the unprecedented low level of 2.6 in 1922. But since then it has risen steadily until now it is back nearly to its old figure, the percentage in 1932 being 9.3 for can milk and 10.9 for all samples, tank and can. About 40 per cent of London milk now arrives in tanks. The latest figures for tank milk (for the quarter ended March 31, 1933) show that, of forty-one samples, thirty-four, or 83 per cent, contained tubercle bacilli.

PASTEURIZATION

But these figures apply only to the milk on arrival in London. Practically all the tank milk comes to the big dairy firms, where it is pasteurized on arrival. An examination for the purpose of this special investigation of 282 samples purchased over the counter showed that nine, or 3.2 per cent, contained tubercle bacilli. These samples included milk sent to London both in tanks and in cans, and the presumption is that those containing tubercle bacilli had not been pasteurized, at least not effectively. It is now believed that 90 per cent of the milk supply of London is pasteurized. While there is no reason to believe that commercial pasteurization is not, in the hands of many firms, equivalent to pasteurization as required by the ministry of health, the process is uncontrolled to the extent that no public authority gives a guaranty, as it does in the case of milk sold as "pasteurized," that the plant has been inspected and approved.

The committee recommended that copies of the report be forwarded to the minister of health and the minister of agriculture; that the appropriate minister should urge on the county councils concerned the great importance of insuring a milk supply free from tubercle bacilli and other contaminating organisms, and that the ministers be asked to consider what action should be taken, or further powers obtained, in order to overcome the difficulties created by modern methods of milk transport.

The Problem of Mental Defectives

Lecturing at the London School of Hygiene and Tropical Medicine, Dr. Cyril Burt, professor of psychology at University College, London, said that on the main question of sterilization every one was agreed. But he did not think that it would do much to solve the problem of the mental defective. How many children in the London schools for defective children had defective parents? The majority were from temperamentally unstable or dull parents. If an attempt was made to sterilize all the "carriers" of mental deficiency, about a fifth of the population would have to be sterilized. That would be ludicrous. No single remedy would be sufficient to deal with the whole of the problem. Professor Burt advocated mental inspection in addition to the present medical inspection of school children. What was wanted was a population of mind power rather than man power. A real survey of the whole population was needed. Mental deficiency was actually on the increase in rural areas, which had a larger proportion of defectives than the towns. Lured by the attractions of the cities, people had been flocking into them in the last fifty or sixty years, leaving all the dull yokels behind. There they had remained, and inbreeding no doubt aggravated the dulness. In Warwickshire, where Shakespeare came from, it had been found that nearly 4 per cent of the rural population of the county were mental defectives. In the village from which Shakespeare emerged, three surnames accounted for 70 per cent of the population, which showed the enormous extent of inbreeding.

PARIS

(From Our Regular Correspondent)

Oct. 11, 1933.

The Examination of Automobile Drivers

A convention was held in Paris, during the annual automobile show, to consider the problems affecting the "safety of the highways." In addition to discussions about automobile brakes, modes of illumination, signals and road signs, an entire section was devoted to discussing the medical examination of drivers of automobiles. Numerous accidents are, no doubt, due to the bad physical condition of the drivers manifested in such ways as poor vision or hearing, dizziness due to circulatory disorders, epilepsy, nervous disorders or alcoholism. As far back as 1923, the Academy of Medicine demanded that persons affected with serious organic defects be not permitted to drive an automobile. That resolution had no direct effect. Mr. André Tardieu, during the period that he served as minister of public works, was asked, in 1927, on the floor of parliament, by a member of the chamber of deputies, whether it was not possible to require a medical certificate attesting to the competence of every person who drives an automobile. At that time there were more than 300,000 automobile drivers, and Mr. Tardieu said that such an examination, although desirable, was practically impossible. He emphasized that if the requirement should be made retroactive it would take several years and necessitate the mobilization of more competent experts than the country could furnish. It was decided therefore to subject to examination only such persons as became involved in automobile accidents, the purpose being to discover whether they were suffering from any physical defect that would render their driving dangerous. The permit to drive was withdrawn from persons who had driven while in a state of intoxication, as established by the decree of 1928. In June, 1930, the Academy of Medicine renewed its demands. Acting on a report of Dr. Claude, it demanded that every automobilist on whom any penalty whatever is imposed, even though only because of having exceeded the speed limit, be required to submit to a mental examination.

As of Aug. 1, 1930, the minister of public works, who has charge of everything pertaining to the highways, decided that a medical examination should be required of all persons requesting a permit to drive large public vehicles, the examination to be given by one of a group of physicians designated by the prefect of the department. In 1931 the Academy of Medicine requested that this examination be construed to include drivers of all vehicles carrying more than eight persons, and

that it be renewed every two years for public corporations and every year for private enterprises. In Paris, the prefecture of police imposes a rigorous examination on all drivers of autobusses, the certificate based on such examination being subject to renewal periodically. The results have been excellent, for the Paris autobus company, since the introduction of these regulations, has observed that accidents caused by its vehicles have diminished by 16 per cent and that, in indemnities paid to victims, it has saved 1,500,000 francs ($90,000). The drivers of taxis have not yet been made subject to this examination, but demands are heard on all sides that the examination should include them. Of thirty-six taxicab drivers subjected to an examination by Dr. Toulouse, at the Psychiatric Institute of the Hôpital Ste. Anne, after having become involved in accidents, ten were found to be affected with dementia paralytica, twelve with psychasthenia associated with impulses and obsessions, two with alcoholic dementia, two with epilepsy, two with toxicomania, four with alcoholism, and three with dementia praecox.

The convention on the Safety of the Highways heard Dr. Levy-Valensi report all these facts. He referred to the research of Professor Tanon, who has shown that attacks of vertigo may be observed, on the highways, in drivers who have gradually been overcome by exhaust gases in closed automobiles, these gases filtering in through the cracks in the floor of the car, and who has pointed out also that previous ingestion of alcoholic beverages makes a driver more sensitive to this type of intoxication. He emphasized the necessity of eliminating persons with but one good eye, as is done in Belgium. Mr. Levy-Valensi concludes that the following classes should be refused permits to drive: (1) persons affected with progressive diseases of the nervous system, and those whose permanent lesions are incompatible, even after correction with an apparatus, with the proper management of an automobile; (2) persons subject to attacks of hysteria; (3) all epileptics; (4) all psychopaths, with the exception of a few "intermittents," who should be subjected to frequent examination, if they are allowed to drive, and (5) chronic alcohol addicts, who are subject to repeated attacks of drunkenness—to which the convention added heart patients and persons subject to attacks of angina pectoris. It was proposed that permission to drive be refused to applicants more than 50 years of age, for after that age one cannot count on a good training of the reflexes. The convention, at which automobile manufacturers and their representatives predominated, took a peculiar attitude toward the discussions. It was apparent that the convention was not favorable, on the whole, to any restrictions that would be likely to diminish the number of automobile buyers. The majority of the persons present objected to nearly all the measures proposed on the subject by Dr. Levy-Valensi, Dr. Godlewski and Dr. Balthazar. It rejected in a formal manner the imposition of periodic examinations on drivers of other than trucks and large public autobusses. It favored a psychotechnic and medical selection only for professional drivers and a periodic revision of the administrative list of defects constituting inaptitude. The daily press has been evasive on the subject. The medical writers of the political journals, who had prepared for the occasion a number of articles designed to enlighten the public on the subject, were unable to publish them, as they were rejected by the managers of the newspapers at the request of the syndicate of automobile manufacturers, who are big advertisers, for the reason that, in the present state of affairs, it was not desirable that anything should intervene, in the form of a medical examination, that would interfere with the sale of automobiles. The only hope on which one can base suitable control, so far as drivers of private cars is concerned, lies in the accident insurance companies, who are considering the possibility of requiring a medical certificate of aptitude before approving an application for accident insurance. But even this hope is illusive, for all the accident insurance companies are fierce competitors of one another, and an understanding in this matter will be difficult to effect.

International Convention on Combating Tuberculosis

The annual session of the council of the Union internationale contre la tuberculose, the president of which is Professor Nolen of the Netherlands, was held in Paris, and fourteen countries were represented. A session of the council was held at the headquarters of the Union, 66 Boulevard St. Michel, in the forenoon. The scientific session was devoted to the presentation of a paper by Dr. A. Saenz on "Tuberculous Bacillemia." This paper was followed by a general discussion, in which Prof. Léon Bernard, general secretary of the Union, Professor Valtis of Greece, Professor Bezançon of Paris, Prof. Yevrem Nedelkovitch of Yugoslavia, and others participated. The next international conference will be held in Warsaw, Sept. 4-6, 1934, and the following topics have been placed on the agenda: "Biologic Variations in the Tuberculous Virus," Professor Karwacki, Poland; "The Types of Osteo-Articular Tuberculosis and Their Treatment," Professor Putti, Italy, and "The Use of Dispensaries for the Treatment of the Tuberculous," Prof. Léon Bernard, France. An address on the "Supplementary Measures in Combating Tuberculosis in a Rural District in Which the Mortality Rate is Low." will be delivered by Mr. John A. Kingsbury, United States. Following the precedent adopted at the convention held at Oslo and The Hague, ten speakers will be chosen from various countries for each topic, in addition to the principal speaker.

BERLIN

(From Our Regular Correspondent)

Oct. 9, 1933.

Alcoholism and Heredity

Addressing the Freiburg Medical Society, Professor Seiffert of the Freiburg Hygienic Institute reported a study of large groups of children (1,700 from the Kaiserstuhl region and 2,000 from the Margrave territory) as to whether alcohol has any hereditary influence on the gonads. These two regions are well known because of the wines produced there. Records were made with regard to height, weight, chest girth, constitutional type and qualities, and performance in the 60 meter dash. The figures obtained were compared with figures from other regions, as from Freiburg itself. It was found that the children from the grape-growing regions were better developed than the children constituting the control material. Seiffert draws the conclusion that alcohol has no practical importance from the standpoint of its hereditary influence on the gonads. Later, the genealogies of twenty heavy drinkers who were treated in sanatoriums were studied. It was ascertained that heavy drinkers who had no bad hereditary tendencies had healthy children from healthy wives but that with heavy drinkers who displayed such hereditary tendencies it was different. In the latter case, differences were manifest, the nature of the differences depending on whether the bad hereditary influence emanated from one or from both parents. If only from one parent, the research revealed that the effects on the children were not particularly marked; but if from both parents, from 30 to 60 per cent of the children were affected. The conclusion may be drawn that it should be made the rule to compel an alcohol addict to accept treatment on the basis of a physician's advice and not on the basis of a court decision, and that if there is evidence of a marked hereditary trend toward alcoholism the alcohol addict should have a guardian appointed. Heavy drinkers with a marked hereditary trend toward alcoholism, who

periodically become intoxicated, should not be placed in expensive sanatoriums but in a workhouse, where they can earn their living. To sterilize the heavy drinkers in a sanatorium would not help much, since they are usually advanced in years. The selection of addicts to be sterilized should be made from among those who are admitted to the department of public welfare. The problem of finding some means of reducing the number of persons with strong hereditary trends toward alcoholism is an urgent one.

New Trends in Demographic Science

Under the direction of the federal ministry for popular enlightenment, a vigorous publicity campaign on problems pertaining to hereditary biology has been planned. The purpose is to promote discussion of fundamental questions of demographic science, the declining birth rate, economic problems, the law on the prevention of offspring with bad hereditary tendencies, and questions concerning the preservation of the purity of the race in every way possible—through the press, the radio, and the like. It is planned to distribute millions of pamphlets dealing with the demographic policies of the new government. The ministry has appealed to all organizations, leagues and associations to work for the dissemination of these ideas. Detailed demands and proposals are made. The associations are urged to lower the dues of members who have large families. The directors of every association should see to it that every member of their organization becomes familiar with the official publicity material that has been distributed. The pamphlets distributed at a low cost by the local headquarters of the national-socialist party are calculated to bring in money with which to furnish practical aid to the heads of large families. All meetings of the associations and leagues during the next few months must be permeated with heredobiologic ideas and plans.

The Cost of Health Insurance

As announced, the cost of medical care of members of the associations of the federal health insurance system amounted in 1932 to a total of 258,536,000 marks ($93,000,000, current exchange), as compared with 328,224,000 marks ($118,000,000, current) in 1931. In other words, in 1932, 15.14 marks ($5.45), on an average, was expended for each member, and, in 1931, 17.28 marks ($6.22). Whereas the total expenditures for medical treatment have diminished by 21.2 per cent, the cost per member, as a result of the simultaneous decline in membership of 10.2 per cent due to the increased unemployment growing out of the economic crisis, shows only a decrease of 12.4 per cent. The expenditures per member in the metropolitan industrial regions amounted to 16.05 marks ($5.78); in the prevailingly industrial regions, to 15.36 marks ($5.53); in the predominantly agricultural regions, to 14.24 marks ($5.13), and in the purely agricultural regions, to 13.44 marks ($4.84).

Combating Quackery in Danzig

The Free State Danzig has now a decree "for the protection of public health." It provides that cancerous diseases, diseases of women and children, transmissible and infectious diseases, and particularly venereal diseases and tuberculosis, may be treated only by licensed physicians. Irregular practitioners must present themselves to the district physician and prove their ability to recognize dangerous and infectious diseases. If they are unable to furnish satisfactory proof of such ability, they will be required immediately to abandon their activities. Furthermore, unlicensed practitioners are prohibited from performing any intervention associated with an injury of the tissues (injections, vaccination). They are likewise forbidden to use dangerous apparatus.

BELGIUM

(From Our Regular Correspondent)

Sept. 28, 1933.

Schools for Persons with Impaired Vision

A convention of the Association internationale de prophylaxie de la cécité was held in Paris, Nov. 19, 1932, under the chairmanship of Professor de Lapersonne. The entire session was devoted to a discussion of the school for persons with amblyopia. In Belgium nothing has been done in this field. Professor Weekers presented a comprehensive paper on the subject before the Société belge d'ophtalmologie. The first question considered was What children attend a school for pupils with impaired vision. The regulations on this subject are of a tentative nature, since the institution of schools for the preservation of eyesight is of recent date. Nevertheless, certain rules are beginning to take shape. Notably Bartels regards as amblyopic all children whose vision is too good for them to be placed in institutions for the blind and too weak for the ordinary school, although sufficient to permit them to learn to read and write. The visual acuity ranges between 2/10 and 4/10, after correction. Myopic children affected with marked and progressive myopia may be admitted to these schools even though their visual acuity is in excess of the limit indicated. The same principle applies to disorders of the superficial or deep-lying ocular membranes with an evolutional and progressive tendency.

THE NUMBER OF SCHOOLS NEEDED

Owing to the relatively small number of amblyopic children, the creation of a completely equipped school for amblyopic pupils is justified only in cities with at least 100,000 people. A certain number of amblyopic children of nearby rural districts will usually attend the city school. The others may be admitted to the best available school or may be given private instruction. Following the paper of Professor Weekers, the society adopted the following resolution: The Société belge d'ophtalmologie hereby expresses the desire that special schools for children with impaired vision be created in the field of primary education. These children are unable to attend ordinary schools, nor are they in their proper place in institutions for the blind. Their education and their whole life outlook suffer from the lack of such schools. The results secured in the schools for the preservation of eyesight, which have been functioning for several years in various countries (England, France, Germany, Switzerland and the United States), are excellent. It is the duty of our country to follow the general trend on pain of being left behind in matters of education.

Otorhinolaryngologic Congress

At the thirty-ninth congress of the Société belge d'oto-rhino-laryngologie, held at Ghent, under the chairmanship of Dr. Droesbeque, Van Caneghem reported on the pressure and the chemical and cytologic composition of the cerebrospinal fluid in thirty-four patients with extradural complications of ear infections. He found that in half the patients there is hypertension of the cerebrospinal fluid, and that in a third of the cases the hypertension is rather marked (more than 30 cm. of water). This hypertension is noted especially in patients who present an extradural abscess, so that if, in a patient affected with mastoiditis, a pressure above 30 is observed, it is likely that he presents an extradural abscess. Normal tension does not exclude the possibility of a like abscess. Hypertension does not aggravate the postoperative prognosis, nor can it be explained by a collateral edema or by toxic phenomena but only by changes in the circulatory system. In four patients, chemical and cytologic changes in the cerebrospinal fluid were found in the absence of any meningeal phenomenon. They may constitute a first stage in the evolution

of ordinary meningitis; they do not constitute the clinical syndrome of serous meningitis.

Bronchoscopy in Acute Lung Abscesses

Soulas of Paris pointed out that acute pulmonary abscesses in the adult are greatly benefited by intrabronchial treatment. If the patient is treated from the third or fourth week, a few sittings may suffice to effect a radical cure (in forty-seven patients the author secured thirty-three cures, as confirmed by the test of time: from eight months to four years. In some cases, after a definite improvement is brought about, a surgical operation may be necessary (third or fourth, or even the fifth month), and its prognosis is then favorable. The bronchoscopic method does not consist in "broncho-aspiration" or "broncho-injection"; it involves a much more complex intrabronchial action, the basis of which is a cleansing process, or removal of bronchial obstructions, combined with simple instillations.

Society News

The annual congress of the Association of French-Speaking Physiologists was held at Liége, June 7-10, under the chairmanship of Professor Dubois, dean of the Faculté de médecine de Lille. Three papers, by J. Demoor, H. Cardot and V. Henri, and many other communications were presented.

BUCHAREST

(From Our Regular Correspondent)

Oct. 13, 1933.

The Distribution of Narcotics Becomes a State Monopoly

The new health law contains a paragraph which says that henceforth narcotics will be imported and distributed only by the state. A minimal quantity to be purchased is prescribed by the law. In consequence of this order, the prices of proprietary medicines containing narcotics rose sharply. The ministry of health, seeing the detrimental action of the law, in its latest order repealed that part of the law relating to centralization of the distribution of narcotics. The Bucharest office will restrict its activity only to the imposition of the import duties, which were raised considerably. Importers will pay 10 per cent of the face value of all consignments. In pharmaceutic circles it is thought that the ministry of health has given up the idea of centralization of distribution. At the same time they express their indignation over the 10 per cent duty, which they find exorbitant.

In another order, the ministry of health introduced a new stamp tax levied on all kinds of cosmetics. The minister intends to extend the tax to all kinds of proprietary medicines to protect the interests of dispensing chemists, who complained to the ministry of health. Ten years ago they dispensed ten medical prescriptions to one proprietary medicine; at present the rate is just the reverse; they sell ten packages of proprietary medicines to one prescription brought to them for dispensing.

Balkan Medical Week

The Balkan Medical Week is held once a year in one of the Balkan states; namely, Yugoslavia, Rumania, Bulgaria, Turkey or Greece. This year it was held in Belgrade, September 11-13. The first congress was held in 1930 at Athens, the second in 1931 at Constantinople, the third in 1932 at Bucharest. At the Belgrade medical week, the Rumanian delegation was led by the official representative of the ministry of health, Dr. Deculescu, state secretary. The program consisted of discussions of the following themes: the rôle of physicians in the union of the Balkan people; hygienic problems of school children; health in the villages; housing conditions in the rural parts of the Balkan states; inter-Balkan public health collaboration; public health conventions between the Balkan countries; antituberculosis work; pediatrics; the malaria problem in the Balkan states.

The week was opened in the presence of medical delegates of Yugoslavia, Rumania, Bulgaria, Greece and Turkey, in the spacious and beautifully decorated hall of the Yugoslavian Medical Association. Professor Marcovici, president of the Yugoslavian committee, presided. Speeches were made by Deculescu, state secretary, Professor Topa, vice president of the Rumanian delegation, and Akil-Muktar Bey, dean of the medical faculty of Constantinople University.

The Belgrade physicians received their colleagues with the greatest cordiality. They arranged excursions, which offered interesting views; they demonstrated what a strong will, hand in hand with the monetary support of the Rockefeller Foundation, can do and what improvement can be achieved within a single decade in the public health conditions of a country. The guests were given transportation at the frontier of Yugoslavia in Pullman cars, and delegates did not pay during the whole week for trains or for boat fares; they were regarded as the guests of the Yugoslav state.

Pellagra and Malaria in Jassy County

A few years ago their was a general boom among the farmers, and their living conditions were favorable. Pellagra was then almost extinct in Rumania, where a great part of the rural population is consuming maize bread, the flour used being blended with wheat flour. The economic crisis in recent years has forced agricultural laborers to make their bread from pure maize flour with the consequence that pellagra is common in the county of Jassy, the poorest district in Rumania. The ravages of pellagra were augmented by the meteorological conditions this year. The summer was exceedingly wet; rain poured in torrents almost continuously in June and July, so that maize could not ripen in due time. As the peasants needed it for food they cut it down when only half matured, and instead of bread they consumed maize. The magistrates enlightened the rural population about the dangerous consequences, and in some places they sent out inspectors to prevent the cutting of raw and damp maize.

During the excessively rainy summer, many small streams and rivers inundated the adjacent areas. In Jassy County the river Moldava inundated almost all the meadows of the county, which thus became a nest of mosquitoes and malaria. According to the report of the county medical officer, there are more than 10,300 malaria patients in the county. In September, 3,306 fresh cases, with three deaths, were reported. The largest number of cases were in the villages of Stolniceni, between the Pruth and Jijia rivers, where the malaria-free inhabitants could be counted on one's fingers; but in villages built on the slopes, where water could flow down freely, no malaria appeared. The health authorities distributed free quinine, mainly as pills containing 0.05 and 0.10 Gm.

The Protection of Mothers and Children

The text of a new plan for the protection of mothers and children has been sent by the ministry of public welfare to institutes and professional organizations, the intention of the minister being that in the final drafting of the law all those concerned should be satisfied. According to the plan as laid down in the draft, pregnant women, mothers in childbed, and children up to their eighteenth year are entitled to medical and social assistance. The new law will require that in the future couples to be married must undergo a medical examination and be granted a certificate by a city medical officer to be produced before the registrar. The new law contains three drastic paragraphs for controlling abortions.

The draft states that working women in the last two months of pregnancy shall be entitled to a holiday with a certain

fraction of their regular wages. Children up to their eighteenth year will be subject to health control, exercised by the parish or by the town physician in the homes of children and in schools, workshops, studios, factories or other such enterprises where persons under age are working. The ministry of public welfare deems necessary the erection of medicosocial dispensaries and clinics for mothers and children, maintained partly by the state and partly by the municipalities.

The Destitute Children in Russia

Dr. Leo Constantinescu, who has returned from Russia after a sojourn of sixteen years, having been taken prisoner in 1917, gave a popular lecture on the destitute children of Russia. He said that during the rule of the czars there were many children whose parents fell in the war or who became separated from their parents during the flight before invading soldiers. The wretched years succeeding the World War are responsible for the almost countless number of destitute children who wander about in the vast area of the soviet domain. Hundreds of thousands of starving children, the so-called Besprisornys, are tramping all over the country, begging, starving, stealing and indulging in cocaine and sex vices. They roam in large groups from town to town, with a predilection for the railroad tracks, and sometimes their begging assumes a rather threatening character. They have no abode but spend the night under bridges or in tunnels and sheds and naturally become ruined physically and morally. The Russian magistrates realize this danger but have failed as yet to relieve the situation.

CAPE TOWN

(From Our Regular Correspondent)

Oct. 10, 1933.

Annual Meeting of Medical Association

The Annual Scientific Meeting of the Medical Association of South Africa, popularly known as the Medical Congress, was opened by Vice Admiral Evans, commander of the African station, September 25, and lasted for six days. The president of the congress this year is Dr. E. B. Fuller, a specialist in urology and one of the founders of our first medical faculty at the local university. The congress was held in the university buildings, the gardens of which are a blaze of color, owing to the massing of veld shrubs and annuals. It was attended by about a fifth of all practicing physicians, an unusually high attendance. The program was well arranged but, as usual on such occasions, rather overloaded, so that there was little time to discuss adequately the various papers. One of the most interesting discussions was at the combined session of the medicine and public health sections, which had invited the veterinarians to attend to debate the question of bovine tuberculosis. The discussion was opened by Dr. Gilles de Kock of Onderstepoort, the fine experimental and research veterinary laboratory near Pretoria established many years ago by Sir Arnold Theiler. Dr. de Kock emphasized the close connection between human and animal diseases and pleaded for the more general recognition, at medical congresses, of comparative medicine, a plea originally made by Sir Clifford Allbutt that has heretofore fallen on unsympathetic ears. The discussion stressed the importance of bovine tuberculosis as a factor in the general incidence of tuberculosis, a disease that is rapidly spreading in this country. The meeting passed a resolution calling on the government to initiate an investigation into the incidence of bovine tuberculosis. Reference was made to the present unfortunate method whereby natives contracting tuberculosis in the towns were permitted to return to their kraals, where they were not under supervision and were likely to spread the disease.

Another interesting session was devoted to the discussion of medicolegal subjects in general practice. This was opened by Dr. C. J. Albertyn of Pietermaritzburg, who insisted on the urgent necessity to educate district surgeons and general practitioners in country areas in modern forensic medicine. The government has lately consented to join forces with the University of the Witwatersrand and to appoint three whole time district surgeons, who would at the same time act as lecturers in forensic medicine at the university. This is a step in the right direction, for so far there has been no recognized medicolegal expert in the country, and the judges have more than once commented on the unsatisfactory manner in which medicolegal evidence has sometimes been submitted to the courts. A resolution was passed calling on the government to provide similar facilities to those granted to the Witwatersrand and the University of Cape Town, which is the older medical faculty.

The Medical Council

The charter of the profession is the medical, dental and pharmacy act of 1928, which stipulates that there shall be a medical council, of which ten members shall be elected by the profession by ballot. The term of office of the council expires this year, and the retiring president, Dr. Davies, has just issued a report of what the council has done during its term of existence. It has drawn up a code of rules, settled several disciplinary cases, and advised the government on matters in which the profession is intimately concerned. The government nominees on the new council have already been appointed. They include Dr. Davies, who was an elected representive in the last council, and Dr. Stals. The nominations for the elected representatives are not yet known, but it may be taken for granted that they will consist of members of the medical association and, for the most part, specialists. It is generally considered that it would be a good thing if the council had a fair sprinkling of general practitioners among its members. The chief difficulty in securing this is the enforced absence from private practice inseparable from attendance at council meetings. Nevertheless, efforts are being made to induce general practitioners to stand for nomination. At the last election the association ran a "ticket" and was successful in getting most of its nominees appointed, but that method was criticized and this year it has been decided that each province is to nominate six candidates and that the whole twenty-four so nominated shall be balloted for. The act stipulates that not more than four members of the council shall be resident in one province, so that this list of twenty-four candidates ensures a free and fairly wide choice.

The Association's Gold Medal

The medical association awards a gold medal for "meritorious services rendered to the profession." The first medal was awarded two years ago to the veteran Dr. Darley Hartley, emeritus editor of the association journal. The second medal has been awarded to Dr. J. A. Orenstein, director of sanitation of the Rand mines, who for six years held office as president of the association and was largely responsible for the amalgamation of the two medical associations in this country into the present strong association. Dr. Orenstein is lecturer on tropical medicine to the University of the Witwatersrand, which bestowed the honorary degree of LL.D. on him two years ago. He assisted Colonel Gorgas in Panama and was a co-author with Dr. Prince of the history of the medical administration of the Canal Zone.

Report of Carnegie Commission on Poor Whites

The Carnegie commission on the poor white problem has finished three years' work and has published a voluminous report, really a series of reports. The medical and hygienic aspect of the problem has been studied by Dr. Murray, one of the assistant health officers of the department of public health

of the union. He finds that there is no evidence to show that climate, humidity or excessive sunlight leads to physical deterioration and, contrary to most other observers, he is not convinced that malaria plays any important part in the production of poor whites. His data on the latter point, however, are far from conclusive and tend to show merely that in the small groups that he studied the physical effects of malaria could be regarded as negligible. He is of opinion that malnutrition, largely due to insufficient and badly prepared food, is a considerable factor in retardation. The other reports deal with the economic and educational aspects of the problem. The most interesting of them is that which relates the results of the study of intelligence among poor white children and their response to various mental tests, some of which have been specially standardized for children born in South Africa.

Marriages

EDWARD M. DE YOUNG, Nashville, Tenn., to Miss Alma Idell Jackson of Douglas, Ga., at Grand Rapids, Mich., August 28.

JAMES HENRY BOLES, Charleston, W. Va., to Miss Catherine Grace Rupert of Rochester, N. Y., October 18.

GEORGE W. BARTELS, Janesville, Wis., to Miss Winifred Virginia Kyler of Cedar Falls, Iowa, September 16.

FORREST L. CARPENTER, Latta, S. C., to Mrs. Margaret Gailliard Bethea at Monroe, N. C., September 20.

LAWRENCE IGNATIUS CLARK, Toledo, Ohio, to Miss Mae Reardon of North Scituate, Mass., September 27.

GLENN JACKSON BRIDGES, Atlanta, Ga., to Miss Margaret Eugenia Raymond of Augusta, September 21.

ROBERT H. BELL, Carlinville, Ill., to Miss Lydia Reichmann of St. Louis at Indianapolis, September 5.

WILLIAM C. BERNSTEIN, New Richland, Minn., to Miss Mildred Goldberg of Minneapolis, recently.

ROBERT CLARKE, JR., Grant City, N. Y., to Mrs. Elizabeth F. Gallagher of New Brighton, October 15.

PAUL LAWRENCE DENT, Quinwood, W. Va., to Miss Willada Hall Rickman of Roseland, Va., recently.

WILLIAM JAMES CUSICK, Elmira, N. Y., to Miss Doris Romana Conboy of Geneva, October 18.

CHARLES HALL ASHFORD to Miss Caroline Winder Dunn, both of New Bern, N. C., October 28.

CHARLES MEADOWS CLARK to Miss Evelyn Howard, both of McMinnville, Tenn., October 27.

ALLEN STEINWEHR AVERY to Miss Margaret Crawford, both of Toledo, Ohio, October 27.

SAMUEL CLARK FAIN to Miss Virginia Manson Hunt, both of Memphis, Tenn., September 22.

GILRUTH DARRINGTON, Yazoo City, Miss., to Miss Anne Du Buisson Hogue, October 6.

GEORGE LAMAR ARRINGTON to Miss Mary Wilbourn, both of Meridian, Miss., October 7.

HUBERT H. BLANCHARD, Milwaukee, to Miss Sara M. Cox at Waycross, Ga., October 11.

WILLIAM WARD BAXLEY, Porterdale, Ga., to Miss Stella Cater of Macon, November 4.

ABBOTT WILLIAM ALLEN to Miss Helen E. Coughlan, both of New York, September 9.

AUBREY C. BENJAMIN to Mrs. Frances A. Eddy, both of Chelsea, Mass., in October.

HARLEY C. CRANE to Miss Marian Jean Martin, both of Flint, Mich., September 2.

ZENAS HORACE ELLIS, New York, to Mrs. Mignonette Hills at Reno, Nev., August 7.

HENRY ROOSEVELT CRAIG to Miss Anne Rosamond Oliver, both of Detroit, July 8.

JOHN C. DRAKE to Miss Ruth O. Firestone, both of Indianapolis, September 15.

WILLIAM G. BANDY to Miss Eunice Jones, both of Lincolnton, N. C., in August.

Deaths

Burton James Lee ⊕ New York; Columbia University College of Physicians and Surgeons, New York, 1898; professor of clinical surgery, Cornell University Medical College; member of the American Surgical Association, the Society of Clinical Surgery and the Radiological Society of North America; member and past president of the American Radium Society; formerly secretary of the American Society for the Control of Cancer; fellow and at one time member of the board of governors of the American College of Surgeons; clinical director and attending surgeon to the Memorial Hospital, associate attending surgeon to the New York Hospital, consulting surgeon to the Sharon (Conn.) Hospital and the Elizabeth A. Horton Memorial Hospital, Middletown, N. Y.; served during the World War; was decorated with the American distinguished service medal and the French croix de guerre; author of several monographs on cancer and tumor of the breast; contributor of articles to Keen's Surgery and the Oxford Loose-Leaf Surgery; aged 59; died, November 12, of coronary thrombosis.

Hugh Warren Brent, Phoenix, Md.; University of Maryland School of Medicine, Baltimore, 1903; member of the Medical and Chirurgical Faculty of Maryland; fellow of the American College of Surgeons; professor of clinical gynecology at his alma mater; served during the World War; formerly visiting gynecologist to St. Joseph's and University hospitals, and Hospital for Women of Maryland, Baltimore, on the staff of the Union Memorial Hospital, Baltimore, consulting surgeon to the Annapolis (Md.) Emergency Hospital and the Edward W. McCready Memorial Hospital, Crisfield; aged 52; died, August 19, of a self-inflicted bullet wound.

William Fuller, Chicago; Rush Medical College, Chicago, 1887; member of the Illinois State Medical Association; formerly professor of operative surgery and associate professor of clinical surgery at the University of Illinois College of Medicine; fellow of the American College of Surgeons; served during the World War; on the staffs of the Washington Park, Woodlawn and Englewood hospitals; aged 69; died, October 25, of uremia and carcinoma of the prostate.

George Pullen Peed ⊕ Colonel, M. C., U. S. Army, Fort Slocum, N. Y.; University of Virginia Department of Medicine, Charlottesville, 1895; veteran of the Spanish-American and World wars; entered the regular army as an assistant surgeon in July, 1903, and in December, 1903, was made a captain in the medical corps; was promoted through the various grades to that of colonel in 1929; fellow of the American College of Surgeons; aged 58; died, October 20, of heart disease.

George Joseph Eckel ⊕ Buffalo; University of Buffalo School of Medicine, 1907; associate professor of medicine at his alma mater; fellow of the American College of Physicians; past president and secretary of the Buffalo Academy of Medicine; served during the World War; on the staffs of the Emergency Hospital of the Sisters of Charity, Buffalo City Hospital, Buffalo General Hospital and the Mercy Hospital; aged 55; died, October 29, of hypertensive heart disease.

Lewis Augustus Coffin, New York; University of the City of New York Medical Department, 1886; an Affiliate Fellow of the American Medical Association; member of the American Laryngological Association and the American Laryngological, Rhinological and Otological Society; fellow of the American College of Surgeons; formerly on the staff of the Manhattan Eye, Ear and Throat Hospital; aged 77; died, October 30.

William M. Lester, State Park, S. C.; University of Maryland School of Medicine, Baltimore, 1887; member of the South Carolina Medical Association; formerly member of the state board of health; on the staff of the South Carolina Sanatorium; aged 69; died, October 16, in the Memorial Hospital, New York, of esophageal diverticulum and epidermoid carcinoma of the base of the tongue.

William Thomas Joyner ⊕ Roswell, N. M.; University of Arkansas School of Medicine, Little Rock, 1889; past president of the New Mexico Medical Society and the Chaves County Medical Society; past president and secretary of the New Mexico Board of Medical Examiners; on the staff of St. Mary's Hospital; aged 66; died, October 12, of pneumonia.

Charles Edward Waits ⊕ Atlanta, Ga.; Atlanta Medical College, 1915; assistant professor of clinical surgery at his alma mater; past president of the Fulton County Medical Society; fellow of the American College of Surgeons; served

during the World War; visiting surgeon to the Grady Hospital and the University Hospital; aged 44; died, October 21.

Lyman Asa Jones, Walpole, Mass.; Harvard University Medical School, Boston, 1891; member of the Massachusetts Medical Society; at one time state inspector of health in the Berkshire District; formerly superintendent of the Pondville Hospital, Wrentham; aged 67; died, October 26, in the Norwood (Mass.) Hospital, of heart disease and hypertension.

Wallace Leslie Britt ⊕ Jackson, Miss.; Atlanta College of Physicians and Surgeons, 1902; fellow of the American College of Surgeons; served during the World War; on the staffs of the Mississippi State Charity Hospital and the Jackson Infirmary; aged 61; died, October 19, of injuries received in an automobile accident.

Alvin Josiah Kern ⊕ Slatington, Pa.; Cleveland College of Physicians and Surgeons, Medical Department of Ohio Wesleyan University, 1887; University of Pennsylvania School of Medicine, Philadelphia, 1888; formerly member of the state legislature; for nine years member of the school board; aged 68; died, October 14, of heart disease.

Maurice George Albert Milan, Aberdeen, S. D.; Georgetown University School of Medicine, Washington, D. C., 1913; member of the South Dakota State Medical Association; formerly on the staff of the Aberdeen Good Samaritan Hospital; aged 46; died, September 13, of influenza and pneumonia.

Dale L. Martin, Tacoma, Wash.; Northwestern University Medical School, Chicago, 1909; member of the Washington State Medical Association; served during the World War; on the staff of the Tacoma General Hospital; aged 47; died, October 14, in a hospital at Rochester, Minn.

Joel Crawford, Yale, Va.; University of Pennsylvania School of Medicine, Philadelphia, 1883; member of the Medical Society of Virginia; past president of the Post Graduate Medical Society of Southern Virginia; aged 72; died, October 14, in the Petersburg (Va.) Hospital.

Nelson Caryl Davis, Bahia, Brazil, S. A.; University of California Medical School, San Francisco, 1921; member of the American Association of Pathologists and Bacteriologists; director of the Rockefeller Research Laboratories; aged 41; died, October 20.

James M. Billings, Lebanon, Mo.; Miami Medical College, Cincinnati, 1873; member of the Missouri State Medical Association; president and formerly secretary of the Laclede County Medical Society; county health officer; aged 89; died, August 28.

Fred Rolland Dolson, Nowata, Okla.; Tulane University of Louisiana Medical Department, New Orleans, 1898; member of the Oklahoma State Medical Association; veteran of the Spanish-American and World wars; aged 59; was found dead, October 10.

Norman Willis Johnson, Quasqueton, Iowa; Keokuk (Iowa) Medical College, 1904; member of the Iowa State Medical Society; president of the Buchanan County Medical Society; served during the World War; aged 60; died, October 15.

Sarah Lee Goodwin, Chicago; Hahnemann Medical College and Hospital, Chicago, 1893; aged 77; died, October 21, in the Ravenswood Hospital, of cardiac decompensation, following a fracture of the femur as the result of a fall.

William Joseph McCrann, Papillion, Neb.; Louisville (Ky.) Medical College, 1883; member of the Nebraska State Medical Association; formerly on the staff of St. Catherine's Hospital; aged 78; died, October 13, of pneumonia.

Cav Andrea De Lucis, San Francisco; Royal University of Turin Faculty of Medicine and Surgery, Italy, 1881; member of the California Medical Association; aged 82; died, August 2, of aortic stenosis and coronary sclerosis.

John Cunningham Maxwell, Sterling, Ill.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1901; aged 67; died suddenly, October 14, in Houston, Texas, of cerebral hemorrhage.

John William Sharpe, Toledo, Ohio; Faculty of Medicine of Trinity College, Toronto, Ont., Canada, 1878; University of Toronto Faculty of Medicine, 1879; aged 73; died, October 25, of myocarditis, coronary sclerosis and influenza.

Matthias Ambrose Wagner ⊕ Toledo, Ohio; St. Louis University School of Medicine, 1912; served during the World War; aged 44; on the staff of St. Vincent's Hospital, where he died, October 30, of duodenal ulcer.

William Alexander Sloane Geddes ⊕ Birmingham, Ala.; University of Toronto Faculty of Medicine, Toronto, Ont., Canada, 1918; aged 44; died, October 23, in a hospital at Denver, of intracranial hemorrhage.

John E. Baugh, Elkton, Tenn.; University of Louisville (Ky.) School of Medicine, 1880; bank president; chairman of the county board of education for twenty-five years; aged 74; died, October 29.

Herbert Henry Williams, Mohawk, N. Y.; Baltimore Medical College, 1911; member of the Medical Society of the State of New York; served during the World War; aged 50; died, October 15.

John Wesley Clemmer, Columbus, Ohio; Pulte Medical College, Cincinnati, 1876; formerly member of the city board of health; aged 84; died, October 21, of cerebral embolus and cardiac disease.

Oscar Porter Harris ⊕ Mendota, Ill.; Rush Medical College, Chicago, 1902; physician and owner of a hospital bearing his name; aged 62; died suddenly, October 29, of cerebral hemorrhage.

Edwin Isaac Becker, Philadelphia; Jefferson Medical College of Philadelphia, 1897; on the staffs of the Jewish and Germantown hospitals; aged 55; died, October 29, of coronary thrombosis.

John Daniel Doyle, Brooklyn; Queen's University Faculty of Medicine, Kingston, Ont., Canada, 1898; on the staff of the Shore Road Hospital; aged 60; died, November 2, of pneumonia.

Chester Grant Savage, Westerly, R. I.; Baltimore University School of Medicine, 1898; member of the Rhode Island Medical Society; aged 64; died, October 12, of heart disease.

Samuel Alpert, Chicago; University of Toronto Faculty of Medicine, Toronto, Ont., Canada, 1933; aged 26; intern at St. Joseph's Hospital, where he died, November 2, of brain tumor.

Ira Tyson Clemons, Comanche, Texas; Tulane University of Louisiana Medical Department, 1897; aged 63; died, October 22, of injuries received when struck by an automobile.

Samuel John Hartmere ⊕ Boston; Tufts College Medical School, 1929; formerly on the staff of the Boston City Hospital; aged 38; died, November 1, of heart disease.

William Shakespeare Taylor, Johnson City, Tenn.; Vanderbilt University School of Medicine, Nashville, 1896; aged 61; died, October 16, in a hospital at Knoxville.

Herman Richard Gundermann ⊕ Monango, N. D.; St. Louis College of Physicians and Surgeons, 1887; aged 70; died, August 4, in Edgeley, of embolism.

John Harvey Girdner, New York; University of the City of New York Medical Department, 1879; aged 77; died, October 27, in Islip, N. Y., of arteriosclerosis.

George Clarke Webb, Federalsburg, Md.; Maryland Medical College, Baltimore, 1912; aged 50; died, October 19, of arteriosclerosis and cerebral hemorrhage.

Julian E. Camp ⊕ Augusta, Ill.; College of Physicians and Surgeons, Keokuk, Iowa, 1880; aged 75; died, October 30, in Monmouth, of myocarditis.

Charles L. Allen, Muncy, Pa.; Jefferson Medical College of Philadelphia, 1880; aged 75; died, September 19, of arteriosclerosis and angina pectoris.

Charles A. Doolittle, Atchison, Kan.; Kansas City College of Medicine and Surgery, 1916; aged 65; died, October 22, of cerebral hemorrhage.

Dareall Grant Black ⊕ Wilkinsburg, Pa.; Western Pennsylvania Medical College, Pittsburgh, 1899; aged 69; died, October 14, in Pittsburgh.

John Joseph Gaynor, San Francisco; College of Physicians and Surgeons, Buffalo, 1881; aged 79; died, October 5, of cerebral hemorrhage.

Aaron Levine ⊕ Cincinnati; Emory University School of Medicine, Atlanta, 1926; aged 39; was found dead, November 1, of cerebral hemorrhage.

James William Reid, Windsor, N. S., Canada; Halifax (N. S.) Medical College, 1884; aged 74; died, October 29, of heart disease.

Samuel E. Gibbs, New York; Denver College of Medicine, 1883; aged 90; died, September 25, of endarteritis and hypertension.

Robert A. Moore, Silver City, Iowa; College of Physicians and Surgeons, Keokuk, 1881; aged 79; died, October 9, of senility.

William H. Langston ⊕ Orlando, Fla.; Missouri Medical College, St. Louis, 1893; aged 63; died, October 17, of coronary embolus.

Correspondence

THE FOURTH VENEREAL DISEASE

To the Editor:—In the interests of uniform medical nomenclature and to avoid confusion in medical literature, I wish to call attention to the misapplication of the expression "the fourth venereal disease" as used by Cole in his otherwise excellent special article in THE JOURNAL, September 30. In this article the expression is used synonymously with "lymphogranuloma inguinale" in the title, while in the text the expression is used but once, when he says, "It has also been given such names as 'the fourth venereal disease,' 'tropical bubo,' . . ." No reference is given as to when it was first spoken of as "the fourth venereal disease," but judging by the context I would assume that it was not many years ago. Neither was mention made of the disease "erosive and gangrenous balanitis," to which Corbus and Harris (THE JOURNAL, May 8, 1909, p. 1474) gave the status of a fourth venereal disease, although previously Bataille and Berda (*Compt. rend. Soc. de biol.* **41**:689, 1889; *Méd. mod.* **2**:340, 1891, cited by Young: Practice of Urology **2**:195, 1926) asserted that it always followed venereal exposure.

Lack of mention of the last named disease is probably due to its having escaped Dr. Cole's attention and perhaps explains the misuse of the name in connection with "lymphogranuloma inguinale," a disease to which exudative and gangrenous balanitis has no apparent relation. This is no criticism of Dr. Cole, as many urologists are unacquainted with the latter condition and in several textbooks on urology it is not even mentioned. Cabot's "Modern Urology," Volume 1, contains an excellent description of this disease by Corbus. Briefly it is an acute specific ulcerative and at times gangrenous balanoposthitis, apparently due to a spirillum and fusiform bacillus living in symbiosis, and further characterized by moderate inguinal lymphadenopathy and constitutional symptoms such as accompany almost any fever.

W. M. DONOVAN, M.D., Scranton, Pa.

[The letter was referred to Dr. H. N. Cole, who replies:]

To the Editor:—In reply to the note of Dr. Donovan, I would say that I appreciate his calling my attention to the fact that erosive and gangrenous balanitis has been spoken of as the fourth venereal disease; in fact, I have already used this term, I am afraid, with my students in the past. It seems to me, however, that erosive and gangrenous balanitis will never assume the prominent position that lymphogranuloma inguinale has already taken.

In the first place, the average case of erosive and gangrenous balanitis is comparatively benign, if a correct diagnosis is made and if the proper type of measures is used, including the use of oxidizing agents, for example, potassium permanganate or hydrogen peroxide and, exposing the infected area to the open air.

Moreover, erosive and gangrenous balanitis is a far rarer disease than is lymphogranuloma inguinale, and finally the prognosis of an erosive and gangrenous balanitis is far better than what one may get in the average run of lymphogranuloma inguinale. It is rare indeed that one sees severe results from erosive and gangrenous balanitis. I can remember only two cases of mine in which a portion of the penis was destroyed, while with lymphogranuloma inguinale it is my opinion that any case is a potential matter of great importance, and even with the best of care the physician is taking care of a condition in lymphogranuloma inguinale that may lead to very serious end-results, because of the fact that no specific for the disease is available.

On that account I have used the term "fourth venereal disease" for lymphogranuloma inguinale, believing that it has far greater importance than does erosive and gangrenous balanitis, though it is true that the latter disease has in the past been termed "fourth venereal disease." I do not think, however, that this term was used any earlier for erosive and gangrenous balanitis than it has been for lymphogranuloma inguinale.

H. N. COLE, M.D., Cleveland.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

TREATMENT OF EXCESSIVE GROWTH AND OBESITY

To the Editor:—I would appreciate your opinion and advice regarding the diagnosis and treatment of a case of obesity which strikes me as being mainly a glandular imbalance, although there is probably some hereditary factor involved: A girl, aged 8 years, weighs 104¾ pounds (47.5 Kg.) and is 55¾ inches (140 cm.) tall. The hair of the scalp is abundant and of normal texture. The vision is 20/20 in each eye. The nose and ears are normal. The teeth are normal except that they erupted a little early for the patient's age. The throat is normal. The thyroid is not palpable. The chest, heart and lungs are normal. The abdomen is normal except for three horizontal folds of fat extending across the abdomen, the first at the upper part of the abdomen, another at about the middle, and the third across the lower part. Her appetite is normal; she eats little bread or potatoes. The gastro-intestinal tract is normal. The genito-urinary tract is normal except for well developed rather prominent mammary glands. The reflexes are normal. The mental development is normal for the patient's age, or perhaps a little above the average. The patient has the following measurements: head circumference, 20¾ inches (51 cm.); neck, 12½ inches (31.5 cm.); chest, 30½ inches (77 cm.) just above the nipple line; abdomen at the umbilicus, 30½ inches (77 cm.); arm circumference, 10 inches (25.4 cm.) midway between the shoulder and the elbow; wrist circumference, 6½ inches (16.5 cm.). The fingers are short, fat and moderately tapering. The knee circumference is 13½ inches (34 cm.); the ankle circumference, 8½ inches (21.5 cm.). The length of the feet from heel to toe is 8¾ inches (22 cm.). The distance from knee to heel is 15¼ inches (39 cm.). The circumference of the hips is 32½ inches (82.5 cm.). The mother is living at the age of 46. She weighs 213 pounds (96.6 Kg.) and is 68 inches (173 cm.) tall. The father is living at the age of 50. He weighs 185 pounds (84 Kg.) and is 73 inches (185 cm.) tall. There are three sisters, aged 4, 15 and 17 years; two are of average weight and one is slightly under the average. There are two brothers, aged 11 and 13 years; one is of average weight and the other is about 10 pounds (4.5 Kg.) underweight. Please omit name.

M.D., West Virginia.

ANSWER.—From the description, this patient may be showing the effects of hyperactivity of the pituitary gland in regard to the growth hormone. The child is tall for her age and is greatly overweight even in relation to her height. Whatever the cause, however, the actual obesity is due to hyperalimentation and can be reduced by dieting.

The calory requirement of the patient, based on her ideal weight (73 pounds, or 33 Kg.), is about 2,640 calories. A diet of 1,500 calories is sufficient for her basal requirement and growth and should cause her to draw on her fat stores for the energy expended in activity.

The following diet is suggested:

Protein	100 grams	=	400 calories
Fat	50 grams	=	450 calories
Carbohydrate	160 grams	=	640 calories
			1,490 calories

Since the patient will draw largely on her fat stores for the calories not supplied in the diet, the fat content of the diet is about as low as is compatible with palatability. For this reason the carbohydrate content must be kept relatively high, in order to avoid acidosis. The protein content is high in order to insure proper tissue repair and because of its specific dynamic action.

In all such restricted diets, special attention should be paid to the roughage, mineral and vitamin content. Because of the low fat content of the diet, it is wise to give the fat-soluble vitamins in concentrated form.

Any increase in muscular activity which the child can be induced to make, especially in the form of play, will of course aid in the treatment.

MICRO-ANALYSIS OF BLOOD BY GRAVIMETRIC METHOD

To the Editor:—I am interested in the micro-analysis of blood by the gravimetric method. I have Bang's original work on this subject (1913) but nothing later. By now, I should think a complete technic should be developed for this work. Has the Association any standard, approved or official method for such determinations? If so, how could I obtain such directions? If not, could you give me any leads through which I could obtain the information I need?

RICHARD J. DEGRAY, Bethlehem, Pa.

ANSWER.—The later development of Bang's micromethods for blood chemistry by the gravimetric method may be found in the textbook of Bang and Blix: Mikromethoden zur Blutuntersuchung, Munich, Bergmann, 1927. The technic, in brief, is as follows:

The material under investigation is weighed instead of measured with a capillary pipet. The usual titration is used for further steps. In order to weigh such small quantities of fluid for analysis (from 0.1 to 0.15 cc.) Bang uses the torsion scale of Hartman and Braun (Frankfort-on-Main) which records the weight of the small quantity of fluid in a few seconds on a dial. A few drops of the fluid under investigation is placed on special filter paper weighing about 50 mg. (The proper quality of paper, already weighed, may be obtained from Emil Jensen, A. G. Kopenhagen; Warmbrunn and Quilitz, Berlin, or Hartman and Braun, Frankfort-on-Main.) The paper with the specimen is suspended as soon as possible on the torsion scale and the weight read immediately on a dial. The difference in weight between the empty sheet and that with the fluid gives the weight of the specimen used. If whole blood is studied, it is placed directly on the filter paper from the puncture wound in the finger. After weighing, the sheet of filter paper is allowed to dry until the moist shine disappears and the material is then placed in a dry glass receptacle. The paper must be dry enough so that none of the specimen sticks to the glass. Similar sheets are prepared for control weighings. After weighing, the next step of the analysis is carried out. Bang's method has been used for blood sugar and chloride determinations and for the Kjeldahl determination of nitrogen. The technic has certain disadvantages for use in this country. The torsion balance is costly and must be carefully checked from time to time. Modifications of the method have been introduced in which, instead of the weighing, the fluid is quantitatively determined by microvolumetric apparatus and delivered to the filter paper. The filter paper must be of the proper quality and certified before its use. As a result of these difficulties, no American textbook on quantitative clinical chemistry methods includes Bang's technic. The recent revision of Sahli's Lehrbuch der klinischen Untersuchungsmethoden, 1931, volume II, second half, gives the technic for micro-Kjeldahl, sugar and chloride determinations in detail on pages 590, 597 and 617.

PHARMACOLOGY OF POTASSIUM CHLORIDE

To the Editor:—The Council on Pharmacy and Chemistry, in reporting on Hosal (THE JOURNAL, July 22, p. 280) states that "the referee's associate added that a colleague has used potassium chloride in long standing cases of nephritic edema without harmful effects over long periods." Potassium chloride is omitted from the materia medica books at my disposal. Will you kindly discuss the pharmacology of potassium chloride with special reference to its use in nephritis? What authorities sanction its use? Please omit name.

M.D., New York.

ANSWER.—It has long been known that the heart is poisoned by an excess of potassium salts in the circulation, though a small amount is necessary for its action. It has also long been known that relatively large doses of these salts may be administered orally, or even by slow intravenous injection, in normal animals or man without injury, and it has been assumed by some that elimination by the kidneys explains the tolerance of such large doses. The corollary of that assumption is that the potassium salts are more toxic in the presence of nephritis than when the kidneys are normal. This is true as a general statement, but not under all circumstances.

The blood is capable of eliminating many substances with great rapidity by various means, and the kidneys, in a given case, may play a minor part in this elimination. Dr. Gold has recently observed (unpublished report of experiments) that no less than five times as much potassium chloride could be injected intravenously in a normal animal in five minutes without causing death as could be injected safely within half a minute.

It is obvious that the rôle of the kidneys is a minor one in the elimination of potassium salts from the circulation in such a short time, and Dr. Gold observed no perceptible difference in the fatal intravenous dose of potassium chloride in the normal and in the nephrectomized animal with rapid injection, the inference being that the potassium salts passed from the blood serum into the tissues, including the corpuscles.

The case is entirely different when large and frequently repeated doses are given orally over considerable periods, because there is a limit to the amount of the salts that may diffuse into the tissues and prevent the concentration in the blood serum that is injurious to the heart; in short, one should never administer the potassium salts in such a way that the concentration in the blood serum is greatly increased above the normal, and, on the other hand, if this increase is prevented, considerable amounts often may be given without harm.

Many seemingly contradictory statements in the literature may be harmonized if one bears in mind that many factors influence the actual toxicity of potassium salts for the heart, and that the concentration in the blood serum is also determined by a variety of conditions, including the rate of absorption and the rate of elimination, each of which, in turn, is influenced by many conditions.

The use of potassium salts in the treatment of certain cardiac arrhythmias has been discussed by Samson and Anderson (THE JOURNAL, Dec. 31, 1932, p. 2257); and Smillie (*Arch. Int. Med.* **16**:330 [Aug.] 1915) observed acute poisoning resulting from 10 Gm. of potassium chloride in one patient who had chronic nephritis. These authors give numerous references to the literature, which should be consulted by one who wishes to use one of the potassium salts therapeutically.

SATO TECHNIC FOR PEROXIDE REACTION OF BLOOD CELLS

To the Editor:—Would you kindly give me the technic of making peroxidase blood smears by the method of Sato. This is referred to in THE JOURNAL, July 15, page 251, but the technic is not included. Please omit name.

M.D., Ohio.

ANSWER.—The Sato technic for the peroxidase reaction of the blood cells is a valuable improvement over the earlier methods. The technic and a critical analysis of the procedure are presented by Mascher in the *Zeitschrift für klinische Medizin* for May, 1933.

The following solutions are needed: (1) copper sulphate solution, 0.5 per cent; (2) 0.2 Gm. of benzidin dissolved in 200 cc. of distilled water at room temperature, with the addition of 4 drops of 3 per cent hydrogen dioxide after filtering; (3) 1 per cent aqueous safranin solution, as a nuclear stain.

The dioxide solution should be fresh. The benzidin solution should be a saturated solution. To test the solution, equal parts of solutions 1 and 2 are mixed in a test tube. A deep blue should appear immediately. Solution 2 should be kept in a dark cool place. It keeps for about six months.

The staining technic is as follows: The freshly prepared blood smears are allowed to dry in the air. Methyl alcohol should be avoided in cleaning the slides or cover slips. Solution 1 is first added for two minutes, poured off without washing, and then solution 2 added for one and one-half minutes. The smears are carefully washed with a slow stream of water, and stained with solution 3 for two minutes. They are then washed and dried in the air. The technic is simple and the preparations keep indefinitely.

The peroxidase granules of the granulocytes (of bone marrow origin) assume a deep blue-green. The nuclei of the cells and the lymphocytes are red. The red cells do not stain.

This stain is highly sensitive, owing to the presence of the copper sulphate. Not only the myeloid cells but also the monocytes show peroxidase granules. Therefore the Sato stain easily differentiates the myelogenic from the nonmyelogenic blood cells.

NONSPECIFIC TREATMENT OF HYPERSENSITIVENESS

To the Editor:—I have a case of persistent urticaria in which skin tests and test diets have failed to give satisfactory evidence of a specific cause. Will you please outline all known methods with references for the nonspecific treatment of hypersensitiveness? I have already used epinephrine, ephedrine and atropine, but the relief is temporary and the side actions are becoming increasingly unpleasant. What is the present status of calcium and arsenic? Please omit name.

M.D., New York.

ANSWER.—Several other investigations in addition to those mentioned are suggested as a guide to the treatment of this case. Chronic infections, especially those of the teeth and the gallbladder, play a not infrequent part in the causation of urticaria. Gastro-intestinal factors should be investigated, especially the possible presence of a hypochlorhydria. In an occasional case a thyroid deficiency, as found by basal metabolism determination, points the way to the appropriate remedy. In addition to food factors, one should also investigate the possibility of physical allergy—due to heat or cold. Many instances are markedly aggravated by nervous and psychic factors and some persons seem to have the condition caused entirely by emotional disturbances.

If these investigations have yielded no response, less specific means should be tried. It will be possible to describe only a few of the methods here. Calcium lactate or gluconate orally or calcium gluconate or chloride intravenously is of help in some instances, although the blood serum in urticaria does not show a calcium deficiency. Parathyroid extract-Collip, from 4 to 8 units subcutaneously, given at first every day and then less frequently, has been of great benefit in many cases. Some report gratifying results from autohemotherapy. The action of bacterial vaccines is probably a nonspecific one. Five-tenths gram of peptone taken from half an hour to an hour before each meal produces temporary desensitization in some instances. A more drastic measure, which may be tried in a desperate case, is fever therapy.

Dilute hydrochloride acid or urea nitrate from 0.2 to 0.4 Gm. with each meal helps at times. A diet poor in sodium chloride has been recommended. Sedatives to allay the irritation and itching are frequently indicated. Salicylates are sometimes of value. There is nothing of any established value in the use of arsenic.

TREATMENT OF HOOKWORM DISEASE

To the Editor:—Please give me the safest drugs for use in the treatment of hookworm disease. In your opinion what is advisable as to both efficiency and safety in the use of ferric sulphate as advised by Colby and Schaffle? Please omit name.

M.D., Georgia.

ANSWER.—Of the thoroughly tested anthelmintics, carbon tetrachloride is probably the most effective and, if properly controlled, the least toxic. It is, however, in common with thymol, chenopodium and other well known drugs, quite toxic under certain conditions. It can be given in large quantities to man and animals in proper calcium balance, but if sufficient calcium is lacking a guanidine intoxication follows, often resulting in death. This can be controlled by proper calcium therapy. For adults, carbon tetrachloride is generally given in doses of 3 cc., but some use as low as 1.5 cc. or as high as 5 or even 10 cc. Treatment should never be repeated in less than a week. It can be given in capsules or in water or milk and is generally followed within an hour by a magnesium sulphate purge. Carbon tetrachloride is not so effective against Ascaris, and when both worms are present many workers give carbon tetrachloride mixed with oil of chenopodium—as, for example, 2 cc. of carbon tetrachloride and 1.25 cc. of oil of chenopodium.

Among the more recent drugs that give great promise is hexylresorcinol, which apparently not only removes hookworms but Ascaris and to a less extent trichuris and possibly tapeworms. Patients of 12 years or above are given 1 Gm. and children 0.5 Gm. It is administered best in the morning on an empty stomach without food for four or five hours. A saline purge is often given but is not necessary. Although practically nontoxic, it exerts a local irritant action if chewed in the mouth. Gelatin capsules cannot be used and various oils and syrups are unsatisfactory. The best method of administration is a pill made by Sharp and Dohme, in which the crystals are rolled into a ball and coated with sugar.

We do not know of any conclusive demonstration of the effectiveness of ferric sulphate.

TREATMENT OF LUPUS VULGARIS

To the Editor:—Kindly inform me whether in recent years there has been any new development in the treatment of lupus vulgaris aside from the usual methods described in textbooks, such as ultraviolet radiation, x-rays and radium, along with general supporting measures. An American woman afflicted with this condition and resident in Brazil has asked advice concerning the possibility of returning to New York for the purpose of taking intravenous injections of some gold compound which is entirely unknown to me. The patient believes that these injections have benefited her in the past. I should appreciate advice on the latest methods in the treatment of lupus in order that I may intelligently refer the patient to the source of the best available treatment. Please do not publish my name.

M.D., Brazil.

ANSWER.—The most valuable recent addition to the therapy of lupus vulgaris is the Gerson-Hermannsdorfer-Sauerbruch diet, in which salt is restricted as much as possible, a sodium-free substitute being used to flavor the food. Meats are also restricted; but milk and eggs are given freely and raw fruits and vegetables and their juices are pushed. Cooked fruits and vegetables are also used, and phosphorized cod liver oil is given. This has a decided effect on the general metabolism but a much greater one on the skin, reducing the sodium content and consequently the water. Calcium and magnesium are also reduced but are supplied as medicine. Potassium is increased in the skin. This raises the resistance of the skin, and many cases of lupus vulgaris that have resisted ordinary treatment are cured by the diet alone, others being cured by diet and local treatment. Several or many months are required for the full benefit to appear.

Dr. Dörffel (*Proc. Staff Meet., Mayo Clin.* **7**:73 [Feb. 10] 1932), who has studied the effects of this diet thoroughly, believes that it in many cases increases the sensitivity of the skin to old tuberculin, ultraviolet rays, chrysarobin, croton oil and mustard. The Gerson-Hermannsdorfer diet was described in the Berlin letter in THE JOURNAL, Sept. 14, 1929, page 861.

Founded on the discovery of Koch that gold cyanide is the most active deterrent to growth on culture medium of the tubercle bacillus, gold salts have been given intravenously in the treatment of various forms of tuberculosis for some time. Their effects have been disappointing except in lupus erythematosus, in which they have been so successful that they are now regarded as the chief treatment. They fail to benefit some cases of lupus erythematosus and are still more often disappointing in lupus vulgaris. After much experience the dose has been reduced. Of gold sodium thiosulphate, used generally in the United States, the maximum dose is 0.1 Gm., and excellent results from smaller doses are obtained in many cases. It is given once a week for from ten to twenty, sometimes more, weeks. All precautions against kidney, liver or skin irritation must be taken just as in the case of the arsphenamines. Untoward symptoms from overdosage of the gold salts resemble closely those from arsphenamine.

HYPEREMESIS AND ATTEMPTED ABORTION

To the Editor:—One of my patients has been subjected to vomiting every morning and sometimes during the day. Although this is only one of the symptoms of pregnancy, it is more severe than in the usual case. She has a history of repeated attempts at abortion, none of which were successful. March 12, one month from the time of conception, she took manganese dioxide. Two weeks later she tried a compound of aloin and canella and finally she took some ergotin-apiol pills. All of these chemicals produced only stomach pains. She is only 18 and this is her first experience of this kind. Being in desperation, she had an attempt made of emptying the uterus by mechanical means—tamponage. With her cervix packed for about eleven hours, she lived in fright. At the end of that time she pulled out all the gauze. There have been no symptoms of septicemia. The vagina and cervix, on examination, appear normal. Is there any connection between this vomiting and attempts at abortion? Will attempts such as these affect the child in any way? At no time did anything pierce or go into the uterus any farther than the internal orifice of the uterus.

M.D.

ANSWER.—The vomiting in this case is not due to the repeated attempts to produce abortion. Both the vomiting and the efforts to terminate the pregnancy are manifestations that the patient does not want to remain pregnant. The former is unconscious and the latter deliberate but the two give the same information in this particular individual. It is well known that in most cases of severe vomiting of pregnancy, the true cases of hyperemesis gravidarum, there is a large psychic element. This is distinctly true in the early stages of hyperemesis before the toxemic symptoms arise from starvation and other causes. Because of this, some patients with hyperemesis can be cured at the beginning of the illness by means of suggestive therapy alone.

The repeated efforts of this patient prove that it is usually impossible to disrupt a normal gestation by drugs and even by mechanical measures unless the latter invade the uterine cavity. The means which this patient used, including the gauze packing in the cervix, almost certainly have not had deleterious effect on the development of the fetus. Nearly always when the ovum is harmed during the early months of gestation it is expelled spontaneously.

MULTIPLE EMBOLI

To the Editor:—I have recently seen a Gentile woman, aged 48, who gave a history of having her arm suddenly drop to her side while sweeping; it turned blue and remained pulseless for five weeks, with constant pain. Spontaneous recovery ensued, except for absent pulse and incomplete function. Some weeks later the patient had an attack of violent abdominal pain with vomiting, two weeks after which pain developed in the opposite foot. She was treated for rheumatism and neuritis. After several weeks the foot became blue, but with no white or red stage, and partial spontaneous recovery occurred, though the patient was unable to walk. At present a second attack in the same foot, of gradual onset, covering several hours, has occurred. The foot is mottled blue and white, blanching on elevation, except the sole. Only one side is involved. The patient's temperature is 100. Diagnosis of Raynaud's disease was made by some one, also the more colorful one of Buerger's disease, while the country doctor let it go at emboli. Your opinion will be gratefully appreciated. Please omit name.

M.D., Michigan.

ANSWER.—The disappearance of pulsation in the arm, with changes in color, is probably due to arterial occlusion. The fact that this occlusive process is multiple, probably in the arteries of the abdomen and lower part of a leg, makes the diagnosis of embolism tenable. The pain is apparently sec-

ondary to ischemia, probably ischemic neuritis. Emboli usually are one of three types: (1) detached mural thrombi or vegetative thrombi from the heart, such as are seen in valvular diseases or in auricular fibrillation; (2) the multiple products of spontaneous simple thrombosis, the origin of which is probably some disturbance in the coagulability of the blood; (3) in older subjects, detached thrombi from arteriosclerotic plaques on the larger arteries. The rapid course seems to rule out the more chronic arterial occlusive lesions, such as thrombo-angiitis obliterans or arteriosclerotic disease.

TREATMENT OF DIABETES

To the Editor:—A diabetic woman, aged 35, married, who is of the Lorrain-Levi type, 4 feet 8 inches (142 cm.) tall, weighed 59 pounds (27 Kg.) when I first saw her, about one year ago. Her mother died in diabetic coma. The patient had not worked for a year, she had not menstruated for two years, and her nails had almost completely degenerated. She was acidotic. She was placed on a high carbohydrate and protein diet, with large doses of insulin, and went back to work in three months. Her nails have completely regenerated and her menstrual function returned with a normal rhythm four months ago. She now weighs 123 pounds (56 Kg.), is well rounded, and never felt so well in all her life. Her status has been determined as almost totally diabetic. Here is the problem: She is now on a diet of 110 Gm. carbohydrate, 45 Gm. protein and 60 Gm. fat, with 130 units of insulin daily. She always has a blood sugar above 200 and excretes from 0.5 to 4 per cent of sugar in the twenty-four hour specimen. In spite of fractionation of urines and regulated insulin dosage, I have been unable to change this status. There is no evidence of kidney damage, no disturbance of pancreatic function, and no complaints. At times her blood sugar is above 300. I have definitely established that there is no cheating, yet I cannot account for the wide fluctuation. Is there a pancreatic adenoma? What can be done? Please omit name.

M.D., New York.

ANSWER.—Certainly there is no evidence of a pancreatic adenoma in this interesting case. In all previously reported cases of tumor of the pancreas, hypoglycemia rather than hyperglycemia was present. In studying what has been done for this patient, one wonders whether an even higher diet might not be more satisfactory than the one given. It has been noted by many observers that both total calories and carbohydrates may be increased in some diabetic patients without a corresponding increase in the insulin intake. In other words, this means that the insulin sometimes works better when there is a larger amount of carbohydrate to work on. At any rate it is worth trying. The carbohydrate should be raised perhaps 15 or 20 Gm. daily without at first increasing the insulin.

INTERCOSTAL NEURITIS ASSOCIATED WITH INJURED CARTILAGE

To the Editor:—I should like your opinion on the following case: A girl, aged 19, complains of pain and occasional swelling in the region of the left lower anterior ribs, of a year's duration. She received a blow in that region a year ago. Palpation reveals a loose cartilage. Roentgen examination is negative, of course. Will diathermy and strapping bring complete relief? Is surgery ever used in these cases?

A. VANDO DE LEÓN, M.D., New York.

ANSWER.—The occurrence of pain and swelling in the region of the left lower ribs anteriorly following an injury is not unusual. The swelling is probably due to a prominence of the end of the cartilage, which has been torn loose. There is an intercostal neuritis, probably due to displacement of the cartilage with tension on the nerve. Strapping of the region with adhesive plaster may give relief and may be discontinued after a short time. Diathermy may be tried for a short time. If no relief is obtained, injection of the intercostal nerve with procaine hydrochloride followed by a little 95 per cent alcohol may give relief. As a rule, nothing need be done for the loose cartilage, as the condition usually is without symptoms. If injection of the nerve is not feasible, it may be cut down on and either injected with alcohol alone or cut in addition to the injection.

DERMATITIS IN SILK INDUSTRY

To the Editor:—Please advise me what forms of dermatitis occur in employees of silk mills and whether or not there is a book published describing the forms of the skin conditions caused from working in a silk industry.

J. OTIS LISENBY, M.D., Atmore, Ala.

ANSWER.—Starting with the raw silk, it is possible that a dermatitis may be produced by the silk glue "sericin," which is early removed in the silk manipulative processes, usually by hot solutions of soap and (or) alkalis. Thereafter in many stages of silk preparation various chemicals are used in weighting, lustering, delustering, sizing and finishing. Scores of chemicals and combinations of chemicals are employed. Nearly every plant utilizes slightly different processes, many of them guarded as trade secrets. Later, in preparation for dyeing and in dyeing, many other chemicals are employed.

In the making of artificial silk, in contrast to natural silk, the number of chemicals employed is usually higher, and prospects of dermatitis are always greater. Among other substances that have been used, in natural or artificial silk manufacture or in both, are thiosulphates, Irish moss, formaldehyde-phenolic resins, diethylphthalate, xylene sulphonamide, paratoluene sulphonamide, monomethyl-xylene sulphonamide, beeswax, tragacanth, spermaceti, cetyl alcohol, Japan wax, stearic acid, acacia (gum arabic), gelatin, turkey red and various other oils, polysulphates, trichlorethylene, sodium carbonate, sodium sulphate, magnesium chloride, dextrins, kana gum, starch, mineral acids and organic acids.

It is not known that books devoted to dermatoses in this industry have been written. More information may be gained by referring to comprehensive treatises of the silk and rayon industries, in which are listed various chemical substances that have been found to be serviceable toward industrial ends. It will be readily recognized that many of these chemicals are skin irritants and that suitable exposure may be followed by chemical dermatitis.

DEAFNESS FOLLOWING INFECTION OF VESTIBULE

To the Editor:—Can you suggest a treatment that will help in a case of infection of the vestibule? The infection occurred when the patient was traveling on a badly ventilated train over a year ago. When the patient awoke in the morning there was an acute coryza, fever and chill. Within twenty-four hours it had spread to the middle ear and caused deafness and headache with fever. A week in a hospital relieved the general symptoms, but deafness continued about three months and was accompanied with giddiness and other symptoms of involvement of the vestibule. The eustachian tubes continued to be occluded until quite recently. Even now the passage of the eustachian catheter is not altogether satisfactory. The specialist attending does not think that he can do any more to relieve the condition. The present condition is perforation of the right drum from childhood; no discharge occurs, but there is very little hearing. The left drum is now healthy looking. There is no discharge or discomfort in the nose. The voice sounds go out through the right ear, and the voice does not seem right. Musical notes sound out through the right ear and not of the correct note. There is no giddiness now. Confusion and deafness occur when the patient is in a room full of people or in the presence of much noise. Please omit name.

M.D., Newfoundland.

ANSWER.—It is quite possible to have involvement of both the cochlear and the vestibular apparatus of the inner ear, as a result of a toxemia resulting from some acute infection. Complete functional testing of the hearing would show whether at the present time there is still considerable impairment of the inner ear or whether it is the conduction apparatus that is having the trouble. If it is involvement of the perception apparatus, the use of an alterative, such as potassium iodide, might be of some service. For the relief of the difficulty in the right ear which has been present since childhood it is doubtful whether much can be done. "Confusion and deafness when in a room full of people or in the presence of much noise" is usually noted when there is a marked impairment of hearing. It is possible that the use of a proper aid to hearing would be of service in this condition.

UNILATERAL CYANOSIS

To the Editor:—I would be pleased if you could give me some help as to the etiology of unilateral cyanosis, limited to the left hand, forearm and arm. The case is one of a 4 months old infant, previously healthy in every respect. The mother observed that, when the child was placed on its abdomen, the hand became blue, then the forearm and arm. The phenomena occur in less than two minutes, and when the child is placed in the dorsal position the cyanosis clears up. There is no associated pain and the child is contented and happy. Roentgen examination of the chest is negative and no palpable masses can be elicited in the axilla. Kindly omit name.

M.D., West Virginia.

ANSWER.—Unilateral cyanosis in an infant suggests the following possibilities: 1. Congenital dilatation of the veins, the so-called phlebectasia. This condition usually carries with it no serious significance and is symptomless. 2. Venous obstruction, such as that caused by congenital anomaly of the cervical rib. The fact that this condition changes with changes in posture raises the possibility of some anomaly of the bony structures of the neck. 3. Pressure from a new growth. This seems fairly well ruled out by the fact that the cyanosis can be modified by the posture of the child.

There is one additional condition to consider: arteriovenous fistula, in which there is distention of the veins from an abnormal communication with the arteries. In this condition the affected extremity would be hotter than the opposite and the veins would contain arterial blood.

Thrombophlebitis seems eliminated by the absence of swelling.

BRONCHOMONILIASIS

To the Editor:—A woman, aged 22, single, gives a history not unlike that of insidious tuberculosis—chronic fatigue, pain over the upper part of the chest, hoarseness, afternoon elevation of temperature and blood-tinged sputum. Physical examination of the chest gives negative results. Roentgen examination of the chest made at the local tuberculosis hospital and also by the state examining chest clinic showed no pulmonary pathologic changes. Repeated examinations were negative. Repeated sputum examinations were negative for tubercle bacilli. The state department of health, however, found on sputum testing a yeastlike micro-organism resembling Monilia. Other specimens of sputum were asked for and the final report sent me was that the yeastlike micro-organisms were a monilia which proved to be pathologic for white rats. Can this organism be the cause of the symptoms in this case? There are no symptoms of sprue, with which Monilia is mostly associated. I can find no description in tests of similar conditions being produced by Monilia. Please omit name.

M.D., New York.

ANSWER.—This case could easily be one of what Castellani has called bronchomoniliasis; but it is either a mildly virulent or a beginning case, for usually there are physical signs of localized lesions confirmed by x-ray shadows. The important finding here is a monilia pathogenic for white rats. Such a monilia is apt to be Monilia albicans, as this is a pathogenic organism not only of thrush but also of sprue, bronchomoniliasis and moniliasis of the skin. Ashford writes that he no longer believes in his own Monilia psilosis or in Castellani's many pathogenic species as entitled to separate designations and believes that all these pathogenic species should be referred to as Monilia albicans until some other method than that by sugar fermentation tests becomes available to show differential characteristics. The reader is referred to the article of T. R. Boggs and M. C. Pincoffs entitled "A Case of Pulmonary Moniliasis in the United States" (*Tr. A. Am. Phys.* **30**:474, 1915; *Bull. Johns Hopkins Hosp.* **26**:407, 1915).

INDICATIONS FOR CALDWELL-LUC ANTRUM OPERATION

To the Editor:—What are the indications for the Caldwell-Luc antrum operation? Is it now commonly done? Please omit name.

M.D., Indiana.

ANSWER.—The Caldwell-Luc operation on the maxillary sinus is used quite frequently at the present time. When a chronic infection of the antrum of Highmore is not relieved or improved by relatively simple procedures such as making an opening into the antrum by way of the inferior meatus, it is advisable to do an operation of the Caldwell-Luc or similar type, in order that a complete inspection of the antral cavity may be had. Not only when a definite suppuration is present but in cases of polyp formation or when a neoplasm is suspected, inspection of the maxillary sinus, by way of the canine fossa, offers the best opportunity for making a definite diagnosis before removing pathologic tissue.

TRENDELENBURG TESTS OF VARICOSE VEINS

To the Editor:—In his book "Varicose Veins," McPheeters states: "In conclusion, any vein which shows a positive, negative, double, or nil Trendelenburg and which does not increase in size and cause pain when tested with the tourniquet or bandage while walking, should be injected." If this is true, why all the ado about doing such a test before injecting in these cases? Please omit name.

M.D., Pennsylvania.

ANSWER.—Dr. McPheeters writes: As the subject being discussed was varicose veins, I took it for granted and assumed that any reader of this test would draw the same conclusion. Certainly no physician would assume that I was meaning normal veins.

Apparently the writer making the inquiry did not carefully read that paragraph. It is accurate and clear and I approve of the test as being more positive and convincing now than when the paragraph was first written. It might be more clear and emphatic if I had said "Any varicose vein which DOES increase in size and cause pain with the tourniquet or bandage applied while walking should NOT be injected. It must be remembered that all these tests are for the BORDERLINE case only and need not be used in each and every case before beginning treatment."

TECHNIC OF CLEARING EMBRYOS

To the Editor:—I have spent some time trying to find an account of the technic used in clearing embryos by the use of methyl salicylate. I would appreciate it if you could direct me to a reference or outline the technic for me.

DONALD A. LAIRD, Hamilton, N. Y.
Director, Psychological Laboratory, Colgate University.

ANSWER.—Inject the vessels, if desired. Fix in solution of formaldehyde. Wash out the formaldehyde thoroughly. Bleach in hydrogen dioxide. Run through alcohols up to 100 per cent. Immerse in benzene. Change two or three times. For large embryos, methyl salicylate 2 parts and benzyl benzoate 1 part or methyl salicylate 18 parts and isosafrol 5 parts are used. For smaller embryos, methyl salicylate 3 parts and benzyl benzoate 1 part or methyl salicylate 27 parts and isosafrol 5 parts. For very small embryos, methyl salicylate 5 parts and benzyl benzoate 1 part or methyl salicylate 9 parts and isosafrol 1 part are used. Pump out with an air pump to get rid of air and benzene. Preserve in the fluid last used. Other methods also are reported by Romeis: Taschenbuch mikroskopischen Technik, Berlin, R. Oldenboure; sold in America by G. E. Stechert, 31 East Tenth Street, New York.

DETERMINATION OF BLOOD UREA

To the Editor:—Will you please advise me as to the value of the modified blood urea nitrogen micromethod of W. G. Karr. The method uses gum ghatti and nesslerization of protein-free filtrate. Is this method as good as the methods using the mercury combining power of blood as an index, such as the Hench-Aldrich? Please omit name and address.

M.D., Kansas.

ANSWER.—The Taylor-Blair modification of the Karr procedure for blood urea nitrogen by direct nesslerization is no doubt an improvement on the Karr method and appears to compare favorably with the older standard aeration and distillation methods after urease action. The method is more specific for urea than the Hench-Aldrich procedure for urea in saliva or urine.

POSTHERPETIC NEURALGIA

To the Editor:—Will you please tell me if there is any method of treating a postherpetic neuralgia aside from local applications of cocaine ointment and morphine? Please omit name.

M.D., New York.

ANSWER.—In spite of the fact that the lesion in postherpetic neuralgia is in the ganglion, experience has shown that sometimes considerable benefit has been obtained from injection of the nerve concerned at its foramen of exit. Thus, cases of supra-orbital herpes may be improved by injection in the supra-orbital foramen. Cases of intercostal lumbar neuralgia may be improved by injection of procaine hydrochloride followed by salt solution or dilute alcohol at the corresponding intervertebral foramina.

FEEDING OF BILE AFTER BILIARY DRAINAGE

To the Editor:—Kindly advise me regarding the feeding of bile back to the patient as it drains out from a cholecystostomy tube. The patient has a tumor obstructing the common duct, which is inoperable, and a tube was placed in the gallbladder for drainage. Would it not be well to give her that bile by mouth once or twice a day? Please omit name.

M.D., Kentucky.

ANSWER.—Yes. This is particularly advisable when biliary drainage is continued for a long period, because by its use severe anemia may be prevented. In the case mentioned here it probably does not make much difference if the lesion is a malignant tumor.

ELECTRORESECTION OF THE PROSTATE

To the Editor:—I have a friend who is suffering with a slight enlargement of the prostate. Is the galvanocautery the treatment of choice in cases of slight enlargement of the prostate, or has the cautery operation superseded prostatectomy? Please omit name.

M.D., Canal Zone.

ANSWER.—Transurethral electroresection is considered the operation of choice by many urologists in the correction of small and moderate sized enlargements of the prostate gland. Some are even employing this method in the treatment of the larger hypertrophies.

DUOCHROME DISC FOR REFRACTION

To the Editor:—I have received a circular on the Sears Duo-Chrome Disc for duo-chrome refraction. Please advise me as to the practical merits of this method of refraction?

J. B. H. WARING, M.D., Wilmington, Ohio.

ANSWER.—The Sears Duo-Chrome Disc is merely another device on the market trying to substitute a manifest refraction for conscientious refraction with cycloplegia. Accommodation is not and cannot be suspended by this or any similar device and as long as accommodation is one of the decisive factors of careful refraction, cycloplegia cannot be dispensed with. If the refractionist is satisfied with by-guess methods, he can come as near to the actual refractive error with the duo-chrome disc as he can with any of the other methods of the drugless glass-fitter.

Council on Medical Education and Hospitals

COMING EXAMINATIONS

ALABAMA: Montgomery, Jan. 9-13. Sec., Dr. J. N. Baker, 519 Dexter Ave., Montgomery.

AMERICAN BOARD OF DERMATOLOGY AND SYPHILOLOGY: *Oral.* New York, Dec. 15-16. Sec., Dr. C. Guy Lane, 416 Marlboro St., Boston.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Written (Group B Candidates).* The examinations will be held in various cities of the United States and Canada, Dec. 9. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

AMERICAN BOARD OF OPHTHALMOLOGY: Cleveland, June 11. Sec., Dr. William H. Wilder, 122 S. Michigan Blvd., Chicago.

AMERICAN BOARD OF OTOLARYNGOLOGY: Cleveland, June 11. Sec., Dr. W. P. Wherry, 1500 Medical Arts Bldg., Omaha.

ARIZONA: Phoenix, Jan. 2-3. Sec., Dr. J. H. Patterson, 320 Security Bldg., Phoenix.

CALIFORNIA: *Reciprocity.* Los Angeles, Dec. 6. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

COLORADO: Denver, Jan. 2. Sec., Dr. Wm. Whitridge Williams, 422 State Office Bldg., Denver.

CONNECTICUT: *Endorsement.* Hartford, Nov. 28. Sec., Dr. Thomas P. Murdock, 147 W. Main St., Meriden.

DELAWARE: Wilmington, Dec. 12-14. Sec., Dr. Harold L. Springer, 1013 Washington St., Wilmington.

DISTRICT OF COLUMBIA: Washington, Jan. 8-9. Sec., Dr. W. C. Fowler, 203 District Bldg., Washington.

KANSAS: Topeka, Dec. 12-13. Sec., Dr. C. H. Ewing, Larned.

KENTUCKY: Louisville, Dec. 5-7. Sec., Dr. A. T. McCormack, 532 W. Main St., Louisville.

MARYLAND: *Regular.* Baltimore, Dec. 12-15. Sec., Dr. Henry M. Fitzhugh, 1211 Cathedral St., Baltimore. *Homeopathic.* Baltimore, Dec. 13-14. Sec., Dr. John A. Evans, 612 W. 40th St., Baltimore.

MINNESOTA: *Basic Science.* Minneapolis, Jan. 2-3. Sec., Dr. J. C. McKinley, 126 Millard Hall, University of Minnesota, Minneapolis.

NATIONAL BOARD OF MEDICAL EXAMINERS: The examinations will be held at centers in the United States where there are five or more candidates, Feb. 14-16. Ex. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

NORTH CAROLINA: Raleigh, Dec. 2. Sec., Dr. B. J. Lawrence, 503 Professional Bldg., Raleigh.

NORTH DAKOTA: Grand Forks, Jan. 2. Sec., Dr. G. M. Williamson, 4½ S. 3rd St., Grand Forks.

OHIO: Columbus, Dec. 6-8. Sec., Dr. H. M. Platter, 21 W. Broad St., Columbus.

OREGON: Jan. 2-4. Sec., Dr. Joseph F. Wood, 509 Selling Bldg., Portland.

PENNSYLVANIA: Philadelphia, Jan. 2-6. Sec., Mr. W. M. Denison, 400 Education Bldg., Harrisburg.

RHODE ISLAND: Providence, Jan. 4-5. Dir., Dr. Lester A. Round, 319 State Office Bldg., Providence.

VIRGINIA: Richmond, Dec. 6-8. Sec., Dr. J. W. Preston, 28½ Franklin Road, Roanoke.

WASHINGTON: *Basic Science.* Seattle, Jan. 11-12. *Regular.* Seattle, Jan. 15-16. Dir., Mr. Harry C. Huse, Olympia.

WISCONSIN: *Basic Science.* Milwaukee, Dec. 16. Sec., Prof. Robert N. Bauer, 3414 W. Wisconsin Ave., Milwaukee. *Regular.* Madison, Jan. 9-12. Sec., Dr. Robert E. Flynn, 401 Main St., LaCrosse.

Massachusetts May Examination

Dr. Stephen Rushmore, secretary, Massachusetts Board of Registration in Medicine, reports the oral and written examination held, May 23-25, 1933. The examination included 64 questions. An average of 75 per cent was required to pass. Ninety-eight candidates were examined, 34 of whom passed and 64 failed. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent
Yale University School of Medicine		(1919)	75
Emory University School of Medicine		(1928)	77.5
Boston University School of Medicine		(1932)	75.3, 75.5, 87.3
College of Physicians and Surgeons, Boston		(1932)	75
Harvard University Medical School		(1928) (1931)	79.5, 82.6, 83.5, (1932) 79.2, 79.5
Middlesex College of Medicine and Surgery, Boston		(1930) (1931)	79.2, 75, 75.2, 76.1, 76.3, (1932) 76
Tufts College Medical School		(1932)	76.4, 78.7, 79.6, 79.9, 85.3
University of Oregon Medical School		(1931)	77.1
Jefferson Medical College of Philadelphia		(1932)	78.7
Temple University School of Medicine		(1932)	75.2
Woman's Medical College of Pennsylvania		(1930)	75.5
University of Tennessee College of Medicine		(1929)	79.7
McGill University Faculty of Medicine		(1925) (1931)	75, 78.2
American University of Beirut School of Medicine		(1913)	75
Osteopaths*			75, 75.5, 75.8, 76.5

College	FAILED	Year Grad.	Per Cent
Georgetown University School of Medicine		(1931) (1932)	64.1, 69.2, 71.2
College of Physicians and Surgeons, Boston		(1931) (1932)	64.2, 64.5, 57.5, 71.7
Middlesex College of Medicine and Surgery, Boston		(1922) (1926) (1928) (1929) (1931)	62.2, 67.6, 58.6, 67.6, 52.2, 56.3, 58.5, 65.4, 67, 68.3, (1930) 61.7, 69, 68.8, 69.5, 69.8, 69.8, 70.2, 70.4, 70.9
Tufts College Medical School		(1932)	71.3, 74
Kansas City Univ. of Phys. and Surgs., Missouri		(1929) (1930) (1931) (1932) (1933)	69.1, 63.7, 55.3, 54, 66.5, 67.8, 68.8, 69.2, 73.1, 51, 58, 66, 70.4
Missouri College of Medicine and Science		(1927)	63.5
St. Louis College of Physicians and Surgeons, Missouri		(1920) (1923)	34, 49.5
Hahnemann Medical College and Hosp. of Philadelphia		(1932)	71.2
University of Vermont College of Medicine		(1932)	72.3
Laval University Faculty of Medicine		(1925)	63.9
University of Montreal Faculty of Medicine		(1932)	67.2
Regia Università di Roma degli studi. Facoltà di Medicina e Chirurgia		(1925)	19.7
Osteopaths*			44.5, 51.2, 52.3, 55.2, 56.9, 57.7, 60.8, 62.7, 66.2, 66.7, 69, 71.1, 72, 73.2, 73.5

Thirty-one physicians were licensed by endorsement from February 9 to July 28. The following colleges were represented:

College	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
College of Physicians and Surgeons of Chicago		(1906)	N. B. M. Ex.
Johns Hopkins University School of Medicine		(1922), (1925), (1929)	N. B. M. Ex.
Boston University School of Medicine		(1931)	N. B. M. Ex.
Harvard University Medical School		(1928), (1929, 3), (1930, 5), (1931, 7)	N. B. M. Ex.
Tufts College Medical School		(1931, 4), (1932, 2)	N. B. M. Ex.
University of Michigan Medical School		(1928)	N. B. M. Ex.
Albany Medical College		(1929)	N. B. M. Ex.
Cornell University Medical College		(1932)	N. B. M. Ex.
McGill University Faculty of Medicine		(1931)	N. B. M. Ex.

* Examined in medicine and surgery.

Missouri June Examination

Dr. E. T. McGaugh, state health commissioner, reports the written examination held in St. Louis, June 7-9, 1933. The examination covered 14 subjects and included 97 questions. An average of 75 per cent was required to pass. Two hundred and one candidates were examined, all of whom passed. Sixteen physicians were licensed by reciprocity and 3 by endorsement. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent
University of Arkansas School of Medicine		(1932)	82.7
University of Colorado School of Medicine		(1932)	87.3
Howard University College of Medicine		(1932)	83.4, 84.5, 85, 85, 85.3, 85.6, 88.8
Northwestern University Medical School		(1933)	87, 87.6
Rush Medical College		(1932)	83.3, (1933) 86.5
University of Illinois College of Medicine		(1933)	86.7
University of Kansas School of Medicine		(1932)	80.6, 82.3, 87.6, (1933) 83.4
University of Louisville School of Medicine		(1932)	85.1, 86.1, 86.5, (1933) 83.4
Harvard University Medical School		(1929)	83.8, (1932) 89.2
University of Minnesota Medical School		(1933)	84.1, 85.3
St. Louis University School of Medicine		(1929) (1932)	83.6, 83.5, 84.1, 84.1, 85.3, 88.3, (1933) 80.9, 81.3, 81.3, 81.6, 82.3, 82.6, 82.7, 82.9, 83, 83.1, 83.2, 83.2, 83.2, 83.3, 83.6, 83.6, 83.7, 84, 84.1, 84.1, 84.2, 84.3, 84.3, 84.3, 84.3, 84.3, 84.3, 84.4, 84.5, 84.6, 84.8, 84.8, 84.8, 84.8, 84.8, 84.9, 85, 85.1, 85.1, 85.1, 85.1, 85.1, 85.2, 85.2, 85.3, 85.3, 85.3, 85.4, 85.5, 85.6, 85.6, 85.6, 85.6, 85.8, 85.8, 85.9, 85.9, 85.9, 86, 86, 86.2, 86.2, 86.6, 86.6, 86.6, 86.6, 86.8, 87, 87.3, 87.5, 87.5, 87.8, 87.8, 88.3, 88.5, 89.1, 90.1
Washington University School of Medicine		(1927) (1931)	86.1, 87.2, 88.5, (1932) 81.9, 83.1, 85.1, 85.5, 85.6, 86.4, 87, 87, (1933) 80.2, 81.3, 82.4, 82.4, 82.9, 83.2, 83.2, 83.4, 83.7, 83.7, 83.7, 83.8, 83.9, 84.1, 84.1, 84.1, 84.1, 84.1, 84.1, 84.2, 84.3, 84.4, 84.5, 84.6, 84.6, 84.6, 84.7, 84.8, 84.8, 84.9, 84.9, 84.9, 85.1, 85.1, 85.3, 85.4, 85.4, 85.4, 85.4, 85.5, 85.6, 85.6, 85.8, 85.8, 85.9, 86.1, 86.3, 86.3, 86.3, 86.3, 86.3, 86.4, 86.5, 86.6, 86.6, 86.6, 86.6, 86.7, 87.1, 87.1, 87.4, 87.4, 87.5, 87.8, 88, 88.5, 88.8, 88.8, 88.9, 89.2, 89.3, 90.2
University of Nebraska College of Medicine		(1932)	83.8
New York University, University and Bellevue Hospital Medical College		(1932)	84.6
University of Oklahoma School of Medicine		(1932)	87.1
University of Pennsylvania School of Medicine		(1932)	84.6
Meharry Medical College		(1932)	86.6, 88.5
University of Tennessee College of Medicine		(1931) (1932)	82.8, 83.4
Vanderbilt University School of Medicine		(1930)	84.7

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Arkansas School of Medicine		(1927)	Oklahoma
Howard University College of Medicine		(1930)	Kansas
Northwestern University Medical School		(1931) (1929)	Illinois, Minnesota
Indiana University School of Medicine		(1931)	Indiana
University of Kansas School of Medicine		(1932, 3)	Kansas
Tulane University of Louisiana School of Medicine		(1932)	Louisiana
University of Nebraska College of Medicine		(1930)	Nebraska
College of Physicians and Surgeons, Columbia College		(1885)	New York
Ohio Medical University		(1903)	Oklahoma
University of Oklahoma School of Medicine		(1932)	Oklahoma
Meharry Medical College		(1932)	Tennessee
University of Tennessee College of Medicine		(1933)	Tennessee
University of Texas School of Medicine		(1930)	Texas

College	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement with
Johns Hopkins University School of Medicine		(1930)	N. B. M. Ex.
Harvard University Medical School		(1931)	N. B. M. Ex.
University of Nebraska College of Medicine		(1925)	N. B. M. Ex.

Book Notices

The Therapeutic Agents of the Quinoline Group: Cinchophen, Plasmoquine, Nupercaine, Quinine and Acridine Dyes; the Relation Between Their Chemical Constitution and Pharmacologic Action. By W. F. von Oettingen, M.D., Ph.D., Assistant Professor of Pharmacology, School of Medicine, Western Reserve University, Cleveland, Ohio. American Chemical Society Monograph Series, No. 64. Cloth. Price, $6. Pp. 301, with 10 illustrations. New York: Chemical Catalog Company, Inc., 1933.

Chemical agents derived from the quinoline nucleus have found wide usage in therapeutics. Such common and well known drugs as quinine and its derivatives, oxyquinoline sulphate, cinchophen, nupercaine and the acriflavines are related to quinoline. With the exception of quinine and its naturally occurring chemical relations, most of the drugs in the quinoline group are the result of laboratory investigation. Many of them have been produced and found their usefulness since the World War. The chemical and the pharmacologic and therapeutic literature on this group of drugs of diverse use is widely scattered in the chemical, pharmacologic and medical literature. Dr. von Oettingen has made a worth-while contribution to the literature of chemistry, pharmacology and therapeutics by collecting between two covers this widely scattered information. The book, however, is not a mere compilation of data. It is a careful attempt to correlate, whenever the data permit, the ground already gained and, even more important, the path along which future progress may be made. The material in the book will be of little interest to the general practitioner, but for the practitioner interested in the manner by which drugs are therapeutically established there will be much information. Here the book should be welcome to the thoughtful practitioner, particularly in respect to such drugs as cinchophen, the importance of which both as an agent for good and as an agent for harm has already been appreciated; and nupercaine, as representative of the group of local anesthetics derived from quinoline. For the investigator on chemistry and drug action there is much of value; here the book should be welcome and extremely useful. The author understands not only pharmacology but also chemistry and medicine. It was indeed fortunate that the American Chemical Society could obtain one of Dr. von Oettingen's versatility to handle such a restricted field as that of the quinoline group. There are a number of tables and charts, summarizing the literature, apart from the descriptive material. This book is one of a series of monographs published under the auspices of the American Chemical Society. It indicates the close dependence of medicine on chemistry.

Röntgenatlas der Lungenerkrankungen: Ein Leitfaden für Ärzte. Von Dr. W. Brednow, Privatdozent für innere Medizin und Röntgenologie an der Universität Göttingen, und Dr. E. Hofmann, Facharzt für Röntgenologie, Städt. Krankenanstalten Wuppertal-Barmen. Second edition. Paper. Price, 10.50 marks. Pp. 207, with 105 illustrations. Berlin & Vienna: Urban & Schwarzenberg, 1933.

This atlas consists of a collection of more than a hundred excellent full-page reproductions of roentgenograms illustrating normal and abnormal conditions of the lungs. The value of the reproductions is greatly enhanced by the accompanying legends, which point out the changes to be observed and their significance. Since the book is designed primarily for the general practitioner, it contains concise information about the course of various diseases, certain favorable and unfavorable changes that may occur during the progress of the condition, and therapeutic hints, particularly section of the phrenic nerve, and collapse treatment. It is pointed out that several disease conditions may produce similar roentgenographic changes and that a final diagnosis of pulmonary disease should not be based on a roentgenogram alone. The material is so arranged that normal aspects are first described. Then follows a rather complete presentation of pulmonary tuberculosis. The value of oblique exposures is emphasized in certain obscure instances. Nontuberculous conditions such as pneumonia, pulmonary infarct, abscess, silicosis, tumor and pleural diseases are then illustrated and described. The value of the book would be enhanced by including some reproductions of bronchography. Some of the changes of the pleura shown in the illustrations are not very distinct. This atlas is in every sense a useful and practical aid for the clinician for whom it is primarily designed rather than for the expert roentgenologist.

Operative Surgery: The Abdomen and Rectum. By Dr. Martin Kirschner, Ordinarius Professor of Surgery and Director of the Surgical Clinic at the University of Tübingen (Germany). Volume 2. Authorized translation by I. S. Ravdin, B.S., M.D., J. William White, Professor of Research Surgery, University of Pennsylvania. Cloth. Price, $12. Pp. 569, with 395 illustrations. Philadelphia: J. B. Lippincott Company, 1933.

The second volume of Kirschner's Operative Surgery, appearing two years after the first, which was received enthusiastically, equals it in quality and appearance. This one deals with the various conditions affecting the abdomen and rectum and covers the field thoroughly and completely in seven chapters. The careful consideration of abdominal incisions and operative procedures on the gastro-intestinal tract is followed by an extensive description of the various operations on the stomach and duodenum. The operations on the small and large intestines, as well as on the rectum, including the procedures to be followed in cases of mechanical and paralytic ileus, are treated in great detail. The same may be said of the discussion of the operations on the gallbladder and parenchymatous abdominal organs, which concludes the work. The subjects treated are fully covered, clearly presented and easy to follow, enhanced no doubt by the excellence of the translation. The numerous beautiful illustrations, mostly in color, which clarify and emphasize the important points in the text, are the great feature of the book. The work is an unusually excellent contribution and is highly recommended to young as well as experienced surgeons.

Opothérapie endocrinienne: Les bases physiologiques, les syndromes, la posologie de l'opothérapie. Par Guy Laroche, professeur agrégé à la Faculté de médecine de Paris. Second edition. Paper. Price, 48 francs. Pp. 396, with 19 illustrations. Paris: Masson & Cie, 1933.

A chapter on liver therapy in pernicious anemia has been added, and the chapter on the pancreas and insulin revised and enlarged, but the book is still mediocre and of little help to practitioners or research men in this country. There is too little critical evaluation of the thousands of trials, suggestions and recommendations for organotherapy in human disorders, many of them unverified or disproved. Thus the author outlines ovarian organotherapy in toxic goiter, chronic rheumatism and virilism.

Filterable Virus Diseases in Man. By Joseph Fine, M.D., B.Sc., D.P.H., Assistant to the Prof. of Public Health, Edinburgh University. Cloth. Price, $2.25. Pp. 144. Baltimore: William Wood & Company, 1932.

This book gives in compact form the essential facts concerning the virus diseases in man, of which there are listed twenty-four. They are divided into seven groups, whether transmitted by an intermediate host or directly, and whether affecting the skin, the nervous system or the respiratory system. At the end of each chapter is a short but inclusive bibliography. The author has stated the facts concerning the virus diseases concisely and clearly; when authorities have disagreed, he has given all the pertinent evidence on each side of the question. In a few instances in which there are no universally accepted views, such as the identity of the virus of herpes and of epidemic (lethargic) encephalitis, he has given opinions of his own. Foot-and-mouth disease has been omitted. Two tables at the end of the book should prove useful for quick reference. In one, facts are presented concerning the twenty-four virus diseases of man, while in the other are listed brief accounts of all virus diseases of which there was record at the time of writing, including animals, birds, insects and plants.

Traité de physiologie, normale et pathologique. Publié sous la direction de G. H. Roger, professeur honoraire de physiologie à la Faculté de médecine de Paris, et Léon Binet, professeur de physiologie à la Faculté de médecine de Paris. Tome IX. Système nerveux, première partie. Par MM. Th. Alajouanine, I. Bertrand et autres. Cloth. Price, 100 francs. Pp. 566, with 121 illustrations. Paris: Masson & Cie, 1933.

This volume is one of eleven into which the work is divided and is devoted to a review of the knowledge of the nervous system, with chapters on the neuron, degeneration and regeneration, nerves and reflex action, tropisms, cortical localization of function, basal ganglions, cerebral circulation, convulsions, sleep, and a biochemical study of general anesthesia. The chapters, written by individual contributors, differ markedly in readability, completeness and the handling of references to the literature, but on the whole the volume will be found useful by those who do not read German or are without access to a German handbook of a similar type.

Medical Biology: A Laboratory Manual of Bacteriology, Mycology, Immunology and Parasitology; Consisting of Experimental Guide, Interpretive Text, Atlas and Protocol Form. By William Barnard Sharp, S.M., M.D., Ph.D., Professor of Bacteriology and Preventive Medicine in the Medical Department of the University of Texas. Medical College Edition. Paper. Price, $4.50. Pp. 443, with 111 illustrations. Galveston: The Author, 1933.

This laboratory manual was prepared for the special use of students in the University of Texas School of Medicine and therefore does not necessarily fit the arrangement and scope of courses in other institutions, although it is so written that it can be easily adapted elsewhere. The major portion of the volume is taken up with material usually given to medical students in the course in bacteriology. Two chapters of more advanced work are included, however, on milk and meat product sanitation and on contamination of foods and drinking water. The final chapter deals with medical zoology, covering the subjects of animal parasites, lice, fleas, flies, mosquitoes, venomous reptiles and marine animals. The author has intended that the student write his own textbook as far as limited time and facilities allow. The handbook contains the salient points, reduced to the least possible number of words, which the student might glean from lectures and standard textbooks; to these he adds his own observations. Simple directions are given the student for each procedure. The manual should be useful in the institution for which it was intended.

The Adrenal Cortex: A Surgical and Pathological Study. By L. R. Broster, O.B.E., M.A., D.M., Surgeon to Charing Cross Hospital, and H. W. C. Vines, M.A., M.D., Pathologist, Charing Cross Hospital Institute of Pathology. Boards. Price, 6s. Pp. 94, with illustrations. London: H. K. Lewis & Company, Ltd., 1933.

A concise account is given of seven cases of virilism of supposed suprarenal origin in which unilateral suprarenalectomy was done. The regression of the virilism following this operation was slight and variable. Microchemical studies of the suprarenal cortex of these cases are presented, the authors presenting evidence of an increase in the suprarenal cortex of a specific "fuchsinophilic" substance as a causative factor in this type of virilism.

The Practice of Podiatry. By Reuben H. Gross, M.Cp., Professor of Podiatry, The First Institute of Podiatry, and E. K. Burnett. Edited by Maurice J. Lewi, M.D. Cloth. Price, $6. Pp. 451, with 72 illustrations. New York: Harriman Printing Company, Inc., 1933.

This book contains much excellent material that the podiatrist can use in his everyday practice, and in addition some interesting reading on conditions that he should know but should not treat. The latter include such conditions as osteomyelitis, arthritis, syphilis, tuberculosis, diabetes, arteriosclerosis, thrombo-angiitis obliterans and Raynaud's disease. The discussions of most of these subjects are well condensed. The book contains much more material than its title would indicate. The section on the history of foot gear is interesting.

Gynecology for Nurses. By George Gellhorn, M.D., F.A.C.S., Professor of Clinical Obstetrics and Gynecology, Washington University School of Medicine. Second edition. Cloth. Price, $2. Pp. 294, with 145 illustrations. Philadelphia & London: W. B. Saunders Company, 1933.

This second edition will be welcomed not by nurses alone but by their medical lecturers as well. That the author is a lucid and graphic teacher is immediately obvious to any one who reads this work. The chapters on constitution and on the endocrine system are valuable additions. The chapter on what the nurse should know about cancer is especially praiseworthy. The book closes with a brief but illuminating account of the history of gynecology.

Pediatrics. By Henry Dwight Chapin, M.A., M.D., and Lawrence T. Royster, M.D., Professor of Pediatrics and Head of the Department of Pediatrics, University of Virginia. Seventh edition revised and rewritten by Lawrence T. Royster. Cloth. Price, $7. Pp. 775, with 149 illustrations. Baltimore: William Wood & Company, 1933.

The former editions of this work appeared under the title of "Diseases of Infants and Children." In the present edition there has been an extensive recasting and revision of subjects. The first part of the book deals with the phenomena of growth and development. Few one volume textbooks on pediatrics go into the subject with the detail that this one does. It is concisely presented, however, and covers only the important phenomena of growth and development that are necessary for a comprehensive understanding. The chapter on appraising the child is excellently done. Criteria of normality are presented with the idea of training the physician to determine the status of the child from an examination, without necessary reference to a fixed standard. The usual subjects found in a pediatric textbook are well covered, and unimportant data have been deleted. An invaluable chapter on the care of dependent infants and children has been included. The Speedwell plan fostered by Dr. Chapin, is clearly explained and discussed. This is a distinct contribution of the work and is unique among pediatric textbooks. The material is well organized and presented in an interesting and concise manner. While it is essentially clinical in its manner of presentation, it has been written with the idea of developing in the reader a better grasp of the problems of the normal as well as of the sick infant and child and will serve the needs of both the physician and the undergraduate equally well.

Beitrag zur Pathologie und Epidemiologie der Pellagra (nach Beobachtungen aus Transkaukasien). Von Priv.-Doz. Dr. E. G. Nauck. Beihefte zum Archiv für Schiffs- und Tropenhygiene, Pathologie und Therapie exotischer Krankheiten, Band XXXVII, Beiheft 2. Gegründet von C. Mense. Paper. Price, 3.60 marks. Pp. 44, with 15 illustrations. Leipzig: Johann Ambrosius Barth, 1933.

This small monograph is a summary of studies of pellagra made by the author in Transcaucasia in 1931. It consists principally of epidemiologic and pathologic observations and a discussion of the different theories of etiology which, although adding little that is new, agree with the generally known facts and views concerning this disease. The excellent bibliography should be of value to students of pellagra.

Insects: Man's Chief Competitors. By W. P. Flint, Chief Entomologist, Illinois State Natural History Survey, and C. L. Metcalf, Professor of Entomology in the University of Illinois. A Century of Progress Series. Cloth. Price, $1. Pp. 133, with 12 illustrations. Baltimore: Williams & Wilkins Company [in Cooperation with the Century of Progress Exposition], 1932.

This delightful little book recounts the ceaseless warfare between man and insects. To be familiar with all the different kinds of insects, a person must learn the names of 10,000 insects each year over a period of sixty years, while the numbers of each particular kind passes man's ability to estimate. Yet, in spite of these odds, man has learned to survive. The book tells what an insect is, describes the lives and habits of some of them and recounts the advances that man has made, especially in the last hundred years, in the battle against those which transmit disease or produce famine by destruction of food supplies.

Essentials of Prescription Writing. By Cary Eggleston, M.D., Assistant Professor of Clinical Medicine, Cornell University Medical College, New York City. Fifth edition. Cloth. Price, $1.50. Pp. 155. Philadelphia & London: W. B. Saunders Company, 1933.

The fact that this volume has now seen the fifth edition should speak well of its popularity, which it well deserves, as it gives the essentials of the prescribing of medicines in a condensed and convenient form.

Syllabus of Psychiatry: A Guide to General Orientation. By Leland E. Hinsie, M.D., Professor of Clinical Psychiatry, College of Physicians and Surgeons, Columbia University. With a foreword by Clarence O. Cheney, M.D. Cloth. Price, $2.50. Pp. 348. Utica, New York: State Hospitals Press, 1933.

Beyond stating that this attempt at a general orientation is well done, little in the way of review is practicable. Dr. Hinsie has summarized in a small volume the thoughts, theories and teachings of those whose influence on psychiatry today is of leading significance. They are grouped under chapters on constitutional concepts, psychic concepts, psychophysical concepts and sociological considerations, with a final chapter on endogeny and exogeny. On page 332 the author says "The principal purpose of this syllabus is to build up a new point of vantage from which one may survey psychiatric conditions, from which one may gain a critical perspective of the several attitudes in order to see their relationships to one another." Effort is made to render correlations between the various schools and to throw new light on the position of mental disorders in the field of medicine in general. The sociological chapter con-

tains a syllabus of lectures to social workers in which freudian theory and interpretations are given with an apparent finality in conflict with the author's statement on pages 134 and 135 concerning such concepts that "no one feels at liberty at the present time to suggest that there is anything of a final nature to the conceptions that have been built around the psychiatric disorder." Definite bibliographic references are unfortunately not given. The book is a valuable supplement but not a substitute for textbooks in psychiatry.

Medicolegal

Malpractice: Negligence in Interpreting Roentgenogram; Motives of Medical Witness May Be Considered.—The plaintiff, while closing a hole in the fourth floor of a building, fell to the second floor. He was removed to a hospital and there attended by the defendant physician. A roentgenogram, taken by means of portable apparatus, was interpreted as showing that no bones were fractured. He remained in the hospital eight days, during which time no additional roentgenogram was made and no treatment was given other than rest and general care. On the eighth day he left the hospital with his physician's consent and with his assurance that no bones were broken. About three weeks after the accident, the injured man consulted other physicians. They found that he was suffering from fractures involving almost the entire structure of the left shoulder. In the end he lost permanently the use of his left arm. In a suit against the physician who attended him in the first instance he obtained a judgment for $20,000. The physician appealed to the district court of appeals, first district, division 1, California.

The expert witnesses for both sides agreed almost unanimously that the roentgenogram made at the hospital was not of the highest type in clarity and detail and that it would not be accepted as a basis for diagnosis by a physician of ordinary skill practicing in the community in which the patient was treated; but notwithstanding this, the evidence showed almost conclusively that it disclosed a fracture. The defendant-physician contended that the interpretation of a roentgenogram involves largely the opinion of the physician who interprets it and that a physician cannot be held accountable for an honest error of judgment. A physician, said the court, in forming an opinion and acting on it, is presumed to have the ordinary skill and knowledge possessed by practitioners in his community. Moreover, the existence or nonexistence of things visible to the naked eye is not a matter of opinion. The evidence was sufficient, the court concluded, to warrant the finding by the jury that in making a diagnosis the defendant failed to use and exercise the required degree of care, skill and learning. The claim of the defendant that the roentgenogram on which he relied was clear and good, although lacking in detail, made his unskilfulness only more apparent. His contention that the roentgenogram was made solely to get a chest picture, to visualize the lung condition and to detect possible internal injuries, was regarded by the court as not in point, since the testimony showed that a roentgenogram taken as this one was would necessarily show the shoulder blade, which was fractured. The testimony showed, too, that in the exercise of ordinary skill and care physicians practicing in the community would have called for additional roentgenograms to enable them to determine the patient's condition.

The defendant urged that if the fracture had been discovered it would still have been a matter of personal judgment on his part whether he would or would not treat the patient as he did. This patient, said the court, was detained in the hospital partly to permit the better observation of developments and for further examination. The jury would have been justified, in the opinion of the court, in finding that, if the fracture had been discovered, ordinary skill and care required that efforts be made to reduce it. A physician cannot be held liable for mere errors of judgment or for erroneous conclusions on matters of opinion, but he must use the judgment and form the opinions, not of a layman, but of one possessed of skill common to medical men practicing in the same or in a like community. The fact that a physician has done his best is no answer to an action for malpractice.

Physicians who attended the plaintiff after he left the hospital, testifying for the defendant-physician, said that the plaintiff's condition was not aggravated by the delay in treatment; that when the plaintiff came under their care there was no bony union and "the shoulders were in normal apposition"; that they found the condition of the plaintiff in all respects the same that would have been present at the outset, without aggravation or increased involvement of any sort. They attributed the wasting and loss of power of the shoulder muscles to injuries to the nerves that normally activate them, such injuries resulting directly from the fall and being unconnected with the fractures. Witnesses for the plaintiff, however, attributed the wasting and the loss of power in the shoulder muscles to the faulty union of the broken bones, with the resultant inability of the shoulder muscles to function. There was, said the court, a direct conflict in evidence and manifestly the jury adopted the views of the witnesses for the plaintiff.

The trial court told the jury that it might consider the demeanor of a witness, the reasonableness or unreasonableness of his testimony, his motives, if any, and his interest. Witnesses testifying for the defendant, said the court of appeals, displayed a direct interest in the outcome of the case. One testified that he was unalterably opposed to malpractice cases, regardless of the facts. Almost all of them testified that they were acting without fee, as a professional duty, to repel the inference that might arise against physicians as a class. Some of the medical witnesses had approached the plaintiff's witness and attempted to intimidate him or at least to dissuade him from testifying, under pain of ostracism. Moreover, the physicians who found the nerve injury in the injured man made a report of their examination, covering thirty pages or more, but in that report they made no mention whatever of any nerve impairment. The same physicians began their treatment by putting the arm into a splint, to remove the bony structure from muscular interference, justifying the obvious inquiry as to what muscular interference could be expected from a muscle already dead. The appellate court could not say what weight the jury gave to the testimony of various witnesses, but if the jury concluded that the medical experts were engaged in some sort of a united effort to pull the case out of the fire as a matter of professional pride or interest, it would naturally discount their testimony to some extent.

The district court of appeals found itself unable to say that the amount of damages awarded was excessive, and being unable to find error in the record affirmed the judgment of the trial court.—*Reynolds v. Struble (Calif.), 18 P. (2d) 690.*

Workmen's Compensation Acts: Compensability of Dermatitis Due to Handling of Dyed Furs.—The plaintiff, a saleslady, handled a shipment of low-priced, dyed furs, "having a bad odor." Shortly thereafter a rash broke out on different parts of her body. Physicians who examined and treated her testified, in her proceeding for compensation under the workmen's compensation act of Michigan, that in their opinion the irritation was caused by handling of the furs. The Supreme Court of Michigan affirmed an award of the department of labor and industry, holding that the dermatitis constituted an accidental personal injury arising out of and in the course of the plaintiff's employment.—*Sherman v. Winkelman Bros. Apparel, Inc. (Mich.), 247 N. W. 159.*

Society Proceedings

COMING MEETINGS

Medical and Surgical Association of the Southwest, El Paso, Texas, Dec. 7-9. Dr. W. Warner Watkins, Box 1587, Phoenix, Ariz., Secretary.

Philippine Islands Medical Association, Manila, Dec. 12-15. Dr. Antonio S. Fernando, 817 Taft Avenue, Manila, Secretary.

Society for the Study of Asthma and Allied Conditions, New York, Dec. 9. Dr. W. C. Spain, 116 East 53d Street, New York, Secretary.

Southern Surgical Association, Hot Springs, Va., Dec. 12-14. Dr. Robert L. Payne, 142 York Street, Norfolk, Va., Secretary.

Western Surgical Association, Cincinnati, Dec. 8-9. Dr. Frank R. Teachenor, 306 East 12th Street, Kansas City, Mo., Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Periodicals are available from 1925 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Heart Journal, St. Louis

8: 729-876 (Aug.) 1933

Production of Anginal Syndrome by Induced General Anoxemia. M. A. Rothschild and M. Kissin, New York.—p. 729.
Induced General Anoxemia Causing ST Deviation in Electrocardiogram. M. A. Rothschild and M. Kissin, New York.—p. 745.
Angina Pectoris: Plea for Greater Optimism in Prognosis. T. S. Hart, New York.—p. 755.
Arterial Hypertension and Arteriosclerosis Associated with Raynaud's Syndrome. Soma Weiss and L. B. Ellis, Boston.—p. 761.
*Circulation Time in Various Clinical Conditions Determined by the Use of Sodium Dehydrocholate. L. Tarr, B. S. Oppenheimer and R. V. Sager, New York.—p. 766.
Congenital Anomalies of Coronary Arteries: Report of Unusual Case Associated with Cardiac Hypertrophy. E. F. Bland, P. D. White and J. Garland, Boston.—p. 787.
Anomalous Origin of Left Circumflex Coronary Artery. W. Antopol and M. A. Kugel, New York.—p. 802.
Premature Beats Produced by Mechanical Stimulation of Exposed Human Heart. J. B. Vander Veer, Philadelphia.—p. 807.
*Relationship of Angina Pectoris to Aortic Valvular Disease. L. B. Laplace, Philadelphia.—p. 810.
*Prognosis in Gonococcic Endocarditis: Review of Literature and Report of Case with Spontaneous Recovery. A. B. Newman, New York.—p. 821.
Rupture of the Aorta. F. C. Narr and A. H. Wells, Kansas City, Mo.—p. 834.
Description of a Monaural Diaphragm Type of Stethoscope with Discussion of Its Special Field of Usefulness. B. Gordon, Philadelphia.—p. 845.
Paroxysmal Ventricular Fibrillation in Relation to Quinidine Therapy: Report of Case. R. F. Escamilla, Boston.—p. 850.

Circulation Time and Sodium Dehydrocholate.—Tarr and his associates outline a procedure for the determination of the velocity of the blood flow and the circulation time using sodium dehydrocholate. The test is usually performed in the morning, without breakfast and under resting conditions. The arm is held at the level of the auricles. The tourniquet is applied just before the injection. The patient is instructed that he will experience a transient bitter taste in the mouth and tongue and is to respond at once when he perceives it. The intravenous injection, from 3 to 5 cc. of a 20 per cent solution of sodium dehydrocholate (the faster the circulation time the less substance is needed to produce the taste), is made rapidly with an 18 gage needle and a 5 or 10 cc. syringe. The time at the start of the injection rather than at the conclusion is taken, since the response may come with a minimum amount of the drug. The taste reaction persists for about ten to twenty seconds. The patient's attention can be distracted from any unpleasant feeling afterward by having him breathe deeply for half a minute. The average circulation time is thirteen seconds. The normal range is from ten to sixteen seconds. The authors determined the velocity of the blood in 140 adult patients with heart disease due to hypertension, arteriosclerosis, rheumatic fever or syphilis. There were forty patients in the group without cardiac failure. The circulation time in thirty of these was within normal limits. In the remaining ten the time was between seventeen and twenty-one seconds. There were 100 patients with signs of congestive heart failure. In ninety-six the circulation time was twenty seconds or more and ranged up to forty-seven seconds. In four the circulation time was less than twenty seconds. The velocity of the blood of a group of fifteen children with rheumatic heart disease was investigated. Their general behavior was similar to that of adults. Active rheumatic fever tended to increase the velocity of the blood in two of these children in whom congestive heart failure was present also. The velocity of the blood was determined in patients with congenital heart disease, subacute bacterial endocarditis, paroxysmal cardiac dyspnea, pericardial tumor, paroxysmal tachycardia and heart block. The authors state that caution must be exercised in interpreting the values for the circulation time in patients suspected of having heart failure in the presence of pulmonary emphysema or marked pulmonary fibrosis. Fever and anemia tend to increase the velocity of the flow of the blood. A slowing of the velocity of the blood was found in patients suffering from polycythemia or myxedema. The velocity of the blood was determined in seventy-eight patients with clinical manifestations of exophthalmic goiter. In sixty-eight patients who showed no evidence of heart failure the velocity of the blood was distinctly faster than normal, and in the ten with signs of cardiac failure the circulation time tended to be an arithmetical average of the two conditions.

Angina Pectoris and Aortic Valvular Disease.—Laplace reviewed seventy-two cases of aortic valvular disease with especial reference to the relation between the incidence of angina pectoris and the height of the diastolic pressures. Angina pectoris occurred in 8.3 per cent of the cases in which the diastolic pressure was 80 mm. of mercury or above, in 33.3 per cent of the cases in which it was between 79 and 40 mm., and in 16.7 per cent of the cases in which it was below 40 mm. The fact that this syndrome did not occur most frequently in the latter group indicates that a low diastolic pressure is of relatively slight importance in the pathogenesis of angina pectoris. The author also studied the incidence of congestive failure, but its increase at low diastolic levels was insufficient to account for the relatively greater decrease in the incidence of angina in the same group. These observations indicate that the appearance of angina pectoris in cases of aortic regurgitation cannot be attributed to an insufficiency of the coronary perfusion pressure during diastole. They support the view of Hochrein that the work of the heart is the most important factor in determining the volume of the coronary blood flow, that the myocardial circulation is relatively little affected by alterations in the diastolic pressure level, and that cardiac systole does not significantly obstruct the coronary vessels.

Gonococcic Endocarditis.—Newman reports a case of gonococcic endocarditis that developed in the course of a gonococcic bacteremia, following an induced abortion by tamponage and subsequently by curettage. This sepsis had run a chronic course of three and a half months preceding admission to the hospital. No valvular lesion was present on admission nor was there anything in the past history of the patient, by direct questioning or by symptomatology, to suggest antecedent valvular disease. During her stay in the hospital, which was markedly septic, an aortic and mitral insufficiency developed, confirmed by fluoroscopic examination and by an increase of pulse pressure under observation. The septic course went into spontaneous remission four months after onset; the patient having developed peripheral embolic phenomena, a focal glomerulonephritis, then went on to recovery and was discharged with an aortic and mitral insufficiency.

American Journal of Diseases of Children, Chicago

46: 239-472 (Aug.) 1933

*Lactic Acid of Spinal Fluid in Meningitis: Practical Diagnostic and Prognostic Value. A. G. De Sanctis, J. A. Killian and Teresa Garcia, New York.—p. 239.
*Clinical Effectiveness of a Cod Liver Oil Concentrate. D. J. Barnes, Detroit.—p. 250.
Poliomyelitis: Comparison Between Epidemic Peak and Harvest Peak. J. A. Toomey and M. H. August, Cleveland.—p. 262.
Preventing Loss of Weight in the New-Born. I. N. Kugelmass, Ruth E. L. Berggren and Mildred Cummings, New York.—p. 280.
Carbohydrate Metabolism: I. Effect of Previous Diet on Utilization of Glucose Injected Intravenously. J. A. Johnston, Detroit.—p. 309.
Atmospheric Conditions in the Small Canvas Tent (Guedel). Grace Lubin and J. G. M. Bullowa, New York.—p. 322.
The Moro Reflex in the New-Born. H. N. Sanford, Chicago.—p. 337.

Meningitis.—De Sanctis and his associates investigated the sugar, lactic acid and cell count of the spinal fluid in various types of meningitis. The modification of Brehme and Brahdy of Clausen's method was used for the determination of lactic acid. Daily analyses of spinal fluid were made on a group of forty-four patients with meningitis throughout their stay in the hospital. The authors observed a rise in the lactic acid of the blood and of the spinal fluid in some cases of epilepsy, encephalitis, chorea and nephritic convulsions and in acute infections, such as pneumonia and mastoiditis. In these conditions the

lactic acid of the spinal fluid is less than that of the blood and varies with that of the blood. In meningitis the lactic acid of the spinal fluid exceeds that of the blood and the authors believe that the increase in the latter is dependent on the increase observed in the spinal fluid. With clinical improvement the lactic acid of the spinal fluid approaches that of the blood. For the determination of pathologic states of the central nervous system, such as meningitis and abscess or tumor of the brain, a knowledge of the ratio of spinal fluid lactic acid over blood lactic acid is a practical diagnostic aid whenever this ratio exceeds 1. The fact that the lactic acid varies directly with the cell count supports the theory that the increased lactic acid of the spinal fluid in meningitis is a product of cellular metabolism. The authors further confirm this fact by their in vitro experiments on glycolysis in spinal fluid.

Cod Liver Oil Concentrate.—Barnes divided forty-two rachitic infants into three groups of thirteen, fourteen and fifteen, respectively, and gave them each day 6, 12 and 18 drops, respectively, of a corn oil solution of a cod liver oil concentrate of such a potency that they received, according to the groups, 4,000 units of vitamin D and 10,000 units of vitamin A, 8,000 units of vitamin D and 20,000 units of vitamin A, and 12,000 units of vitamin D and 30,000 units of vitamin A. Healing was rapid in all cases and was borne out by the return of the blood calcium and phosphorus to normal within an average period of two weeks or less and a rapid increase in strength and activity on the part of the child. Roentgenograms showed rapid calcification, and this roentgen evidence paralleled the improvement in the blood picture. The medication was well taken and caused no dietary disturbances. The healing was due to the cod liver oil concentrate and not to a loss of weight or a stationary weight, as is shown by the progressive gain of the children. That it was not due to the effect of the rays of the sun was evident by the fact that patients with active rickets who showed no healing were continuously coming to the clinic up to the time the experiment was concluded. This cod liver oil concentrate retains its active antirachitic effectiveness as measured in rat units of vitamin D, and, in the dosage levels studied, is remarkably effective in curing rickets in infants.

American Journal of Medical Sciences, Philadelphia

186: 157-312 (Aug.) 1933

Modern Plan for Community Campaign Against Air Pollution. H. B. Meller, Pittsburgh.—p. 157.
Radiologic Recognition of Heart Disease in Pneumonoconiosis. J. M. Dyson, Hazleton, Pa.—p. 165.
Healing of Tuberculous Cavities: Clinical Study. B. T. McMahon and E. H. Kerper, Loomis, N. Y.—p. 170.
Incidence of Rheumatic Fever in New York City Hospitals. J. S. Davis, Jr., New York.—p. 180.
Gastritis in Its Relation to Other Diseases. T. G. Miller, Philadelphia. —p. 192.
The Redundant Duodenum. M. Feldman, Baltimore.—p. 198.
Correlation of Other Diagnostic Procedures with Cholecystography in Two Hundred and Fifty Cases of Suspected Gallbladder Disease. L. H. Hitzrot, Philadelphia.—p. 203.
Personality Type of Patients with Arteriolar Essential Hypertension. D. Ayman, Boston.—p. 213.
*Fractional Phenolsulphonphthalein Test in Bright's Disease. E. M. Chapman and J. A. Halsted, Boston.—p. 223.
Normal Variations in Renal Function Tests with Discussion of Their Physiologic Significance. L. B. Ellis and Soma Weiss, Boston.—p. 233.
Renal Function in Persons with One Kidney. L. B. Ellis and Soma Weiss, Boston.—p. 242.
Nature of Splenic Characters in Banti's Splenohepatic Anemia and Method for Scoring Them: Notes. H. Fox, Philadelphia.—p. 248.
Determination of Nonpaternity by Means of Blood Groups, with Especial Reference to Agglutinogens M and N of Landsteiner and Levine. A. S. Wiener, Brooklyn.—p. 257.
*Chemical Peculiarity of Pellagra Blood (Rapid Iodine Decolorization): Preliminary Note. C. H. Campbell, Oklahoma City.—p. 266.
*Maintenance of Normal Blood in Pernicious Anemia by Means of Intramuscular Injections of Solution of Liver Extract. W. P. Murphy, Boston.—p. 271.
Study of Lymphocytic Hemogram. C. Reich and Eleanor Reich, New York.—p. 278.

Phenolsulphonphthalein Test.—Chapman and Halsted used the fractional method of estimating the elimination of phenolsulphonphthalein (15, 30, 60 and 120 minutes) in twenty normal subjects and a large number of patients with suspected renal disease. They found that in chronic interstitial nephritis the fractional test may show evidence of impaired renal function when the test, as usually done with hourly collections, is interpreted as normal. This fractional test is quite as informative as the urea clearance test and reflects the diminishing function in progressive kidney disease. Since it is easier to perform, it is the method of choice for routine clinical work.

Chemical Peculiarity of Pellagra Blood.—About a year ago, Campbell noticed that the erythrocytes of pellagrous blood caused more rapid decolorization of iodine solutions than other human erythrocytes, whether normal or pathologic. After a series of experiments designed to test this observation, he developed a technic that promises to be of value as a clinical laboratory test in the diagnosis of pellagra. The reagents used are: a mixture of 3 volumes of 95 per cent ethyl alcohol and 4 volumes of ether and an accurately prepared compound solution of iodine. In preparing the color standards, a 3 per cent potassium dichromate solution is made and from this the following dilutions should be made: 1:5, 1:10, 1:20, 1:40, 1:80, 1:120 and 1:240. These standards are placed in a series of test tubes of the same internal diameter. The procedure is as follows: Samples of 5 cc. of normal or nonpellagrous (control) and of suspected pellagrous venous blood are withdrawn and quickly introduced into 15 cc. centrifuge tubes containing 5 cc. of liquid petrolatum. The time of collection of each specimen must be recorded. As each sample is collected, the tube is stoppered and shaken until the blood is defibrinated. The specimens are then allowed to stand from thirty to forty-five minutes, after which they are again shaken and centrifugated at 1,000 revolutions per minute for five minutes. When the tubes are removed from the centrifuge, three distinct layers may be distinguished: an upper layer of fibrin and oil, a middle layer of serum and a lower layer of erythrocytes, leukocytes, and the like (the erythrocytic layer). If any sample has not been properly defibrinated, clots will be present in the lower layer. Now 1 cc. samples of the erythrocytic layers are transferred by means of serum pipets to test tubes of the same diameter as those of the standards. Exactly one hour after taking the venous blood specimen, 5 cc. of the alcohol-ether mixture is added to the corresponding erythrocytic sample, and the tube is stoppered tightly. After the alcohol-ether mixture has been added to all samples, they are allowed to stand for approximately six hours at room temperature (from 25 to 30 C.). At the end of this time a 0.1 cc. portion of the iodine solution is added in rapid succession to each tube by means of an accurate micropipet. This is mixed gently and the stoppers are replaced. As the mixtures stand, there will be noted a gradual diminution of color in each tube but a greater decolorization in the pellagrous samples. Within three hours the extract of pellagrous blood may be completely decolorized, while other samples are not. The most constant difference occurs after the tubes have stood about twelve hours. At this time, the colors of the alcohol-ether extracts should be compared with the potassium dichromate standards. The color range of these standards represents that of most samples which have stood twelve hours. If the color of the unknown matched that of a standard two shades lighter than the nonpellagrous sample, a mild condition of pellagra was apparently indicated. If it compared with a standard three shades lighter than the normal, a moderately developed condition of pellagra was considered to be present. If the unknown compared with or was lighter than the fourth tube from the nonpellagrous or normal standard, advanced severe pellagra existed. The author reached these conclusions by a study of more than 150 hospital and dispensary cases, including a variety of diseases, fifty of which were pellagrous.

Normal Blood in Pernicious Anemia.—Murphy observed that intramuscular injections of the solution of liver extract, given to patients in relapse or whose condition was unsatisfactory because of complications, instigated a remission in each instance, as is to be expected with treatment by means of the ingestion of liver or of an actively potent substitute. The beneficial effects of intramuscular injections occurred sooner and more strikingly than with peroral treatment. Maintenance treatment, carried out by the same means in eighty-one instances for sufficiently long periods of time to allow analysis of the amount of solution needed, shows that an intramuscular injection of the amount of solution derived from 100 Gm. of liver (generally 3 cc.), at intervals varying from one to six weeks, has maintained all these patients in a satisfactory state of

health with a normal condition of the blood. Improvement in the symptoms generally considered to accompany spinal or peripheral nerve damage has occurred regularly and often strikingly, and progression of these disturbances has not occurred in any patient after the blood condition has become essentially normal. Relapse has not occurred in any patient continuing under observation and treatment. The anemia diet, but not including liver, as previously suggested for the patient with pernicious anemia, has been advised in each instance, and a course of large daily doses of iron (ferric ammonium citrate) has generally been prescribed at some time during the course of treatment, in order to allow the hemoglobin level to keep equal with the course of the rapid red blood cell formation. This has been of distinct benefit in improving the physical condition of the patient. It has been possible with the use of the intramuscular treatment to maintain this group of patients in a better state of health and with a more satisfactory condition of the blood than was possible by means of treatment by mouth; the prolonged treatment has been more economical to the patient, and this method of administration of liver substance has usually been better liked.

American Journal of Physical Therapy, Chicago

10: 1-36 (Aug.) 1933

Significance of Early Recognition in Senile Fibrous Hypertrophy of Prostate. G. A. Remington, Chicago.—p. 5.
Colitis and Diet Therapy. D. E. Lane.—p. 11.
Preventive Hydrotherapy. L. J. Llewellyn, Bridgend, Wales.—p. 12.
Effects of Sinusoidal Stimuli on Gastric Acidity. H. Neifeld, Brooklyn.—p. 16.
Why Coagulate the Tonsils? T. G. Atkinson, Chicago.—p. 22.
The "New Deal" in Diet. A. E. Gibson, Los Angeles.—p. 27.

American Journal of Surgery, New York

21: 173-334 (Aug.) 1933

*Therapeutic Effect of Complete Thyroidectomy on Congestive Heart Failure and Angina Pectoris in Patients with No Clinical or Pathologic Evidence of Thyroid Toxicity: II. Operative Technic. D. D. Berlin, Boston.—p. 173.
Peptic Ulcer and Venofibrosis. L. Hauswirth, A. A. Eisenberg and H. Wallerstein, New York.—p. 180.
Effect of Foods on Postoperative Distention: Experimental Study. J. Fine and W. S. Levenson, Boston.—p. 184.
Anatomicophysiologic Considerations in Treatment of Tuberculosis of the Spine. F. H. Albee, New York.—p. 204.
Psychoneuroses: Secondary to Head Injuries. M. A. Glaser and F. N. Anderson, Los Angeles.—p. 210.
Fractures of Carpal Navicular and Triquetrum Bones. J. E. Thompson, New York.—p. 214.
Osteochondritis Deformans Juvenilis of Olecranon. D. S. O'Connor, New Haven, Conn.—p. 227.
*New Method of Reducing Fractures of the Head of the Tibia Involving the Knee Joint. C. R. G. Forrester, Chicago.—p. 230.
Chronic Appendicitis—Duodenal Ulcer. V. G. Burden, Philadelphia.—p. 235.
Gastrojejunal Ulcer in Childhood: Report of Case. J. E. Strode, Honolulu, T. H.—p. 240.
Renocolic Fistulas. V. Vermooten and R. M. McKeown, New Haven, Conn.—p. 242.
Some Studies with Maximum Urea Clearance. L. L. Hill, Jr., Montgomery, Ala.—p. 247.
Newer Concepts on Physiopathology and Treatment of Thrombo-Angiitis Obliterans. H. M. Rabinowitz, Brooklyn.—p. 260.
Ovulation, Menstruation and Hormones. G. J. Hall, Sacramento, Calif.—p. 272.
Management of Abruptio Placentae. S. S. Rosenfeld, New York.—p. 279.
Antivenin in Thrombocytopenic Hemorrhage; Importance of Bothropic Type. K. P. A. Taylor, Havana, Cuba.—p. 285.
Treatment of Acute Empyema: Instrument for Closed Drainage. M. Tomaiuoli, New York.—p. 289.
Repeat of Rare Congenital Malformation of Intestine: Case Report. R. F. Metcalfe, San Francisco.—p. 294.
New-Born Baby with Massive Umbilical Hernia. C. E. Haines and P. T. McIlroy, New Rochelle, N. Y.—p. 297.

Effect of Thyroidectomy in Heart Disease.—Berlin outlines a new method for the treatment of chronic heart disease, which consists in the total ablation of the normal thyroid in patients without clinical or pathologic evidence of thyroid toxicity. The anterior surface of the exposed portion of the gland is searched for atypically located parathyroids. A pyramidal lobe is always sought for and, if found, entirely removed. If the condition of the patient warrants, the gland is totally removed in continuity. A careful search of the entire gland is made for adherent or embedded parathyroids, which, if found, are reimplanted in the sternomastoid muscle in accordance with the technic adopted by Lahey in the operation of partial thyroidectomy. To avoid insult to the laryngeal nerves by the accumulation of serum or the formation of a hematoma, drainage is instituted. Drains are made to pass through the sternomastoid muscle on each side. The skin is closed with Michel clips and a firm sterile gauze dressing is applied. The author emphasizes the necessity for total ablation of the gland in order to insure a persistently lowered metabolic rate.

Method for Reducing Fractures of Head of Tibia.—Forrester states that, in fractures occurring in and about the knee joint and involving the head of the tibia, he waits from a week to ten days for the swelling to subside and then, under a general anesthetic, reduces the displaced fragments with his reconstructed redresseur (straightening instrument), placing the fixed wooden button on the inside or normal area and, by manipulation with the handle of the instrument, producing forcible yet steady pressure over the fractured area with the other button. Following reduction, it is noticeable that the application of the cast does not change the position of the reduced fragments, indicating that the logical time to do this is from a week to ten days after fracture, at which time the organized deposit about the fracture helps to hold it following reduction. Stockinet is applied from the toes to above the knee, as high on the thigh as possible, and a Böhler cast is molded over the entire limb from the thigh to the toes. In from seven to ten days after reduction and application of the cast and as soon as the pain has subsided, the author applies his knee joint hinges. The patient is instructed to manipulate the splint by flexing the joint increasingly each day, beginning with a flexion of 5 degrees on the first day, increasing it to 10 or 15 degrees on the following day, and so on until full flexion has been obtained. The patient should be instructed to extend the knee fully at night and every night, because if this is not done there may form a bony deposit in the anterior chamber of the knee that will lock it and limit full extension.

Annals of Internal Medicine, Ann Arbor, Mich.

7: 145-280 (Aug.) 1933

Aspects of Carbohydrate and Fat Metabolism. C. H. Best, Toronto, Canada.—p. 145.
Analysis of High Caloric Diets in Relation to Weight Changes. J. M. Strang and A. B. Cox, Pittsburgh.—p. 152.
The Rheumatic Lung. C. P. Howard, Montreal, Canada.—p. 165.
*Treatment of Polycythemia: Reticulocyte Response to Venesection, Phenylhydrazine and Radiation. E. H. Falconer, San Francisco.—p. 172.
Polycythemia in Association with Pulmonary Disorders. J. J. Waring and W. B. Yegge, Denver.—p. 190.
*Standard Test for Measuring Variability of Blood Pressure: Its Significance as an Index of Prehypertensive State. E. A. Hines, Jr., and G. E. Brown, Rochester, Minn.—p. 209.
Diagnosis and Medical Treatment of Angina Pectoris. P. D. White, Boston.—p. 218.
*Experimental and Clinical Studies in Surgical Treatment of Angina Pectoris. J. C. White, Boston.—p. 229.
Management of Edema. C. A. Elliott, Chicago.—p. 240.
Problems of Pulmonary Tuberculosis in General Practice. R. Fitz, Boston.—p. 245.
Graphic Study of Changes in Muscular Activity of the Stomach Associated with Certain Epigastric Symptoms. P. B. Welch, Coral Gables, Fla.—p. 251.
Relationship of Autonomic Nervous System to General Medicine. T. P. Sprunt, Baltimore.—p. 257.

Treatment of Polycythemia.—Falconer compared the results of venesection, of the administration of phenylhydrazine hydrochloride by mouth and of irradiation over the spleen and the long bones in the treatment of polycythemia. The results indicate that venesection, used as a means of reducing the red cells and hemoglobin in polycythemia, does not increase the reticulocyte count above normal limits. Irradiation over the spleen or the long bones in polycythemia does not stimulate the bone marrow, as indicated by the reticulocyte count. Owing probably to its slow action in the reduction of the blood level, the average daily reticulocyte count was lower than following venesection. In a patient with true polycythemia, following the administration of 1.4 Gm. of acetylphenylhydrazine the reticulocyte count rose promptly to 8 per cent and fell gradually to normal over a period of eighty-two days. The study suggests that venesection may be a useful adjunct to phenylhydrazine treatment by permitting much smaller doses of this drug to be efficient in maintaining an approximately normal blood level.

Test for Measuring Variability of Blood Pressure.—Hines and Brown outline a test for measuring the variability of

blood pressure, which consists in placing the subject in a recumbent position for fifteen minutes or until the blood pressure has attained or approximated the basal level. In cases of hypertension, as long as forty-five minutes may be required. With the cuff placed on one arm, the opposite hand is placed in ice water having a temperature of from 4 to 5 C.; the blood pressure is taken at the end of thirty seconds and again at the end of sixty seconds. The hand is removed from the ice water and readings are taken every two minutes until the blood pressure returns to its previous basal level. The highest reading obtained is recorded as a measure of the response. Except for a small group of patients with hypertension, the blood pressure returns to the basal level within two minutes after the hand is removed from the ice water. This reaction is independent of any significant changes in the pulse rate. There is a response in both the systolic and the diastolic pressures, but somewhat less and more variable in the latter. It is likely that the response to cold has purely a neurogenic reflex basis, because of the speed of the reaction, which is too rapid for the intervention of any known hormone or chemical factor. A tourniquet producing stasis of the flow of blood in the arm that is immersed fails to inhibit the reaction. The authors observed 230 subjects: 69 normal, 41 with diseases other than of the vascular type, 26 with localized forms of vascular disease, 76 with hypertension and 18 without hypertension who seemed to be normal, except that they gave abnormal reactions. There was evidence to indicate that certain persons have a constitutional or biologic abnormality leading to the development of essential hypertension. Demonstration of this potentiality should be possible theoretically years before the onset of the clinical degrees of high blood pressure. Subjects can be grouped as those with minimal and those with excessive responses of the systemic blood pressure to sensory and psychic stimulation. There is some evidence that the so-called normal persons who exhibit this hyperreactivity will eventually suffer from hypertension unless development of this condition is forestalled. At least 98 per cent of all patients suffering from essential hypertension exhibit excessive reaction to local cold. Patients exhibiting other diseases have normal or minimal reactions. The cold test is useful in determining the efficacy of therapeutic measures to control the vasomotor irritability.

Surgical Treatment of Angina Pectoris.—White is of the opinion that operations on the cervical sympathetic trunk, even if they include the stellate ganglions, cannot interrupt all the pathways of cardiac pain. The upper thoracic sympathetic ganglions or their communicating branches, or the posterior roots of the corresponding spinal nerves, are the logical points at which to interrupt painful stimuli from the heart. These anatomic and physiologic premises have been put to the test in thirty-two cases. In each case in which the author has been sure of a successful interruption of these structures, angina pectoris has disappeared. Paravertebral alcohol injection is difficult technically because of the depth of the nerves and the small areas sclerosed by the alcohol. However, it is the safest method, and its results are far better than the old forms of cervical sympathectomy. The upper thoracic sympathetic ganglions have been resected in four cases, with striking relief of pain on the operated side. However, the author believes that this is too severe an operation for the average patient suffering from angina pectoris and that the best surgical procedure consists of first attempting to block the thoracic sympathetic nerves with alcohol. The patients who fail to obtain satisfactory relief, provided they are reasonably good surgical risks, can finally be subjected to section of the posterior spinal roots.

Archives of Dermatology and Syphilology, Chicago

28: 149-308 (Aug.) 1933

Hydrogen Ion Concentration of Topical Preparations Commonly Employed in Dermatology. O. L. Levin and S. H. Silvers, New York.—p. 149.
Effect of Iodides on Organic Luetin Reaction. H. J. Templeton and C. B. Andrews, Oakland, Calif.—p. 153.
*Chancroid: Its Prevalence; Its Treatment with Specific Vaccines. V. Pardo-Castello, Havana, Cuba.—p. 155.
Vital Reactions of Pulp of Teeth in Syphilis Produced by Induced Currents: Preliminary Report of One Hundred and Ten Cases. W. R. Pentz, Philadelphia.—p. 163.
Erythema Caloricum Associated with a Remote Reaction to Heat (Neurodermatitis and Dyshidrosis): Heat Allergy. H. Tannenholz, Detroit.—p. 168.
Dermatitis Caused by Ethyl Gasoline. D. W. Johnson, White Plains, N. Y.—p. 174.
Coccidioidal Granuloma: Report of Case Originating in Western Texas. L. M. Smith, El Paso, Texas.—p. 175.
Juvenile Elastoma. F. D. Weidman, Philadelphia; N. P. Anderson and S. Ayres, Jr., Los Angeles.—p. 182.
Clinical Variants of Familiar Diseases of the Skin: Phenolphthalein Eruption; Pityriasis Rosea; Lichen Planus; Parapsoriasis. L. F. Weber and H. Rattner, Chicago.—p. 190.
Joseph Jacob Plenk 1738?-1807. J. E. Lane, New Haven, Conn.—p. 193.
*Successful Treatment of Vitiligo. M. H. Cohen, York, Pa.—p. 215.
Blastomycetic Dermatitis by Lymphatic Extension. H. M. Robinson, Baltimore.—p. 219.
Dermatitis of Eyelids Due to Rubber on an Eyelash Curler. E. C. Fox, Dallas, Texas.—p. 222.
Ragweed Dermatitis: Report of Two Cases. Frances Pascher and Marion B. Sulzberger, New York.—p. 223.

Chancroid.—After having used the vaccine of Nicolle and Durand in his hospital service (more than 400 cases) and in a few private cases since 1927 with uniformly good results, Pardo-Castello concludes that vaccine therapy is indicated in all cases of bubo, phagedena and phimosis with inaccessible chancroids. In uncomplicated chancroid, local treatment by means of cauterization with pure phenol and dressings of iodoform powder is usually sufficient to bring about a rapid cure. In some cases electrodesiccation followed by iodoform dressings gives the best results. In the inflammatory cases with secondary infection, wet dressings of potassium permanganate or of copper sulphate 1:1,000 are indicated previous to cauterization. If the lesions fail to heal or if there is any tendency to spreading, vaccine therapy is indicated even in the absence of complications. Patients under treatment for chancroid should be kept ambulatory when possible.

Treatment of Vitiligo.—In a case of leukoderma, Cohen instructed the patient to apply a 10 per cent alcoholic solution of oil or bergamot to all the affected areas twice a day. Ultraviolet irradiation with the carbon arc lamp was applied to the face for from three to five minutes twice a week, and an intravenous injection of gold sodium thiosulphate (0.1 Gm.) was given once a week. Within two weeks the areas on the face had begun to coalesce. At each visit the hyperpigmented patches were seen encroaching on the depigmented spots, and in six weeks the face was completely free from any evidence of the disease. The patches on the thighs and abdomen were also lessened, but the improvement was not as rapid as it was on the face, which had received ultraviolet irradiation in addition to the oil of bergamot. The patient was treated for fourteen weeks, during which period she received a total of 1.4 Gm. of gold sodium thiosulphate. The other vitiliginous areas were treated by several ultraviolet irradiations, with excellent results, but the patient discontinued treatment after her face was freed from the disfigurement. She was seen one year after the last treatment; the vitiliginous areas had not returned. Her face was completely free from any pigmentary disfigurement, and the patches on the thighs and abdomen were greatly improved.

Archives of Otolaryngology, Chicago

18: 145-268 (Aug.) 1933

Objective Tinnitus Aurium: Report of Four Cases. S. Iglauer, Cincinnati.—p. 145.
Tetany in Local Anesthesia. H. S. Wieder, Philadelphia.—p. 155.
Cholesteatoma-Like Accumulations in External Auditory Meatus. Lois D. Greene, Chicago.—p. 161.
*Hemangio-Endothelioma of the Esophagus: Report of Case. A. C. Broders, P. P. Vinson and P. L. Davis, Rochester, Minn.—p. 168.
Mucocele as Cause of Proptosis: Report of Six Cases. W. B. Chamberlin and T. L. Parry, Cleveland.—p. 172.
Hyperesthetic Rhinitis. N. Fox and N. D. Fabricant, Chicago.—p. 181.

Hemangio-Endothelioma of the Esophagus.—Broders and his associates report a case of primary hemangio-endothelioma of the esophagus in which the diagnosis was made during life. The patient was a woman, aged 76, in whom six weeks before examination dysphagia and considerable substernal pain developed rather suddenly. Physical examination revealed nothing significant except that all the teeth were absent and dental plates were worn. Roentgenographic examination revealed an irregular obstruction in the lower part of the esophagus. Esophagoscopic examination disclosed an infiltrating lesion invading the left anterior wall of the lower portion of the esophagus. The lumen of the esophagus was considerably reduced, and a small amount of purulent secretion was observed

extuding from the lesion, which contained a green-producing streptococcus when grown on blood agar plates. Microscopic examination of the tissue revealed an inflammatory process associated with colonies of an organism that appeared to be some form of Streptothrix. Esophagoscopic examination was made two days later and the tube, introduced into the lesion to a greater depth than before, encountered a foul necrotic mass. A number of small pieces of tissue removed for microscopic study presented the microscopic picture that was noted in those previously examined. The specimen contained the structure characteristic of hemangio-endothelioma. In a few areas of the specimen were groups of closely packed, relatively small hyperchromatic round and oval neoplastic cells. For the most part, however, the specimen was made up of a network of small, ill defined blood vessels and spaces lined with endothelial cells that were indistinguishable from those that were closely packed. The authors believe that the presence of these neoplastic vessels represents an attempt of the tumor cells to differentiate, and therefore is an indication of lowering of the clinical malignant condition. Occasionally, mitotic figures appeared in both the solid and the vascular areas.

Archives of Surgery, Chicago

27: 227-426 (Aug.) 1933

Electric Shock: Presentation of Cases and Review of Literature. F. L. Pearl, San Francisco.—p. 227.
Carcinoma of the Lip: Clinicopathologic Analysis of Seventy-Seven Cases and Suggestion for Rational Plan of Treatment. O. R. Hyndman, Iowa City.—p. 250.
Amputation Through Lower Third of Leg for Diabetic and Arteriosclerotic Gangrene. B. C. Smith, New York.—p. 267.
*Effect of Morphine on Movements of Small Intestine and Sphincter Muscles. T. C. Orr and H. E. Carlson, Kansas City, Kan.—p. 296.
Cancerphobia: Special Relation to Insignificant and Fancied Lesions of the Tongue. J. W. Spies, Peiping, China.—p. 306.
Prognosis in Carcinoma of Stomach: Remote Results of Surgical Treatment to January 1930. A. P. C. Ashhurst and J. W. Klopp, Philadelphia.—p. 320.
*Lymphatic Drainage of Joints. J. G. Kuhns, Boston.—p. 345.
*Wound of the Superior Vena Cava Treated by Suture: Report of Case. I. A. Bigger, Richmond, Va., and B. W. Wilkinson, Clarksburg, W. Va.—p. 392.
Clinical Consideration of Gastric Ulcer and Carcinoma. J. W. Hinton, New York.—p. 395.
Review of Urologic Surgery. A. J. Scholl, Los Angeles; E. S. Judd, Rochester, Minn.; L. D. Keyser, Roanoke, Va.; J. Verbrugge, Antwerp, Belgium; A. A. Kutzmann, Los Angeles; A. B. Hepler, Seattle, and R. Gutierrez, New York.—p. 402.

Effect of Morphine on Intestine.—Orr and Carlson studied the effect of morphine sulphate on the movements of the jejunum in dogs by means of kymographic tracings taken with a balloon in Thiry-Vella loops, through Ivy-Mann enterostomies of the upper jejunum and of the ileum through an ileostomy, and also its effect on the movements of the small intestine in human beings by means of tracings taken with a balloon through an ileostomy opening, by observations of large hernias and by auscultation of both the normal and the pathologic abdomen. Morphine sulphate in ordinary doses gives an increase in tone, an increase in the amplitude of segmentation movements and an increase in the frequency and amplitude of peristaltic waves. Large doses stop peristalsis and decrease the tone, but segmentation movements are little affected and may be somewhat increased. The duration of the effect of an average dose of morphine on the intestine is about six hours. This is true for both animals and man. Morphine stimulates the obstructed as well as the unobstructed intestine in animals as recorded by the kymograph, and in man and animals as determined by auscultation. There appears to be no increase or decrease in response to morphine as death approaches. A single dose of morphine caused retention of the barium meal in the animal and in the human stomach. The emptying time was at least twice the normal. A marked delay in the emptying of the ileum in the dog was noted. Morphine evidently produces a spastic action on the sphincters which delays the progress of barium through the gastro-intestinal tract.

Lymphatic Drainage of Joints.—Kuhns attempted to find out the nature of the lymph canals of the joint in the lower extremity and their drainage and also any possible relationship of lymphatic drainage to arthritis. Injections of india ink were made directly into the joints of living young adult animals. Light ether anesthesia was given in order to prevent extravasation of the ink into periarticular structures. From this study the author concludes that lymphatic canals are present as abundant small vessels in the tissues lining joint cavities. They are most numerous just beneath the endothelial cell layer of the synovial membrane. The lymphatic drainage of the joints in the lower extremity is through the so-called deep lymphatic canals to the popliteal, deep femoral and iliac lymph nodes. Inflammation in the synovial tissues results in a decreased ability on the part of the lymphatic canals to absorb material larger than of molecular size. An apparent obliteration of the lymphatic vessels occurs when the inflammatory process is sufficiently severe or long continued. With the subsidence of the inflammatory reaction, the lymphatic canals are again seen in their usual size and distribution, and absorption of particulate substances by the lymphatic vessels is observed. Persistent inflammation in synovial tissues is dependent to a certain extent on the failure of the lymphatic vessels to function.

Suture in Wound of Vena Cava.—Bigger and Wilkinson report a case of wound of the superior vena cava treated by suture and state that, when such a vessel is injured outside the pericardium, the signs and symptoms are those of massive intrathoracic hemorrhage, whereas, if the intrapericardial portion is injured, cardiac tamponade is apt to result. No case of repair of such a wound can be found in the literature. Because of this fact and the importance of recognizing the possibility of such a wound so as to make an incision that will give adequate exposure, the authors report their case.

Arkansas Medical Society Journal, Little Rock

30: 59-76 (Aug.) 1933

Importance of Roentgen Examination in Diagnosis of Diseases Within the Thorax. D. A. Rhinehart and W. E. Gray, Jr., Little Rock.—p. 59.
Tragedies of Surgery. C. S. Holt, Fort Smith.—p. 64.

Canadian Medical Association Journal, Montreal

29: 113-226 (Aug.) 1933

British Pioneers in Modern Treatment of Tuberculosis. H. Rolleston, Cambridge, England.—p. 113.
*Electrocardiographic Studies of the Dying Heart in Angina Pectoris. R. L. Hamilton and H. Robertson, Sayre, Pa.—p. 122.
Blood Pressure and Blood Vessels in Cerebral Arteriosclerosis. G. H. Stevenson and G. E. Hobbs, Whitby, Ont.—p. 125.
Agranulocytosis. G. Chown and A. S. Gelfand, Winnipeg, Manit.—p. 128.
Granulomatous Myocarditis. J. Miller, Kingston, Ont.—p. 134.
Primary Sarcoma of the Intestine. F. D. Ackman, Montreal.—p. 137.
Spontaneous Subarachnoid Hemorrhage: Report of Twelve Cases. H. H. Hyland, Toronto.—p. 145.
Infant Care. J. H. M. Knox, Jr., Baltimore.—p. 149.
Acute Appendicitis: Surgical Diagnosis. R. V. B. Shier, Toronto.—p. 155.
The Future of Maternal Welfare. G. Fleming, Montreal.—p. 158.
Spinal Anesthesia in Cesarean Section. K. M. Heard, Toronto.—p. 164.
Cancer of Large Bowel. L. J. Carter, Brandon, Manit.—p. 167.
*Oleothorax: Study of Twenty-Five Cases at the Manitoba Sanatorium, Ninette. E. L. Ross, Ninette, Manit.—p. 171.
Acrodynia. S. English, Simcoe, Ont.—p. 174.

Electrocardiograms in Angina Pectoris.—Hamilton and Robertson present a case history and complete electrocardiographic observations of a patient during an attack of angina pectoris, during the cessation of this attack and during a sudden and fatal second attack, the graph continuing through and after the patient's death. The diagnosis of angina pectoris was confirmed by necropsy. The cessation of the auricular function was noted early; changes then became evident in the ventricular complexes and the heart became extremely irritable, the patient finally dying of ventricular fibrillation. It was possible to hear the heart sounds, with a stethoscope over the apex of the heart, for at least three minutes after the beginning of the ventricular fibrillation. A study of the electrocardiogram shows that cessation of the cardiac function is not simultaneous with clinical death but follows this. In comparing the process of the dying heart in this case with that of other reports, the authors find that it is not identical in all cases. Cessation of function precedes chemical changes and, until these changes take place, it is possible by stimulation to get a return of cardiac function. This explains the beneficial effect of epinephrine injections after clinical death in a number of such cases reported. Clinical death does not coincide with chemical or physiologic death.

Oleothorax.—Ross gives a study of oleothorax based on twenty-five cases. Indications for its use were persistent purulent

pleural effusion, ineffective or obliterative pneumothorax, mobile mediastinum and bronchopleural fistula. He considers olive oil less irritating and more absorbable than liquid petrolatum, especially in empyemas. Sensitiveness of the pleura should be tested at the beginning by small amounts of oil. In his series, 60 per cent gave no reaction. Thirteen of the patients were improved, nine were unimproved (one of the nine left the sanatorium and so discontinued treatment early), one became worse and two died. In seven, or 58 per cent, of the empyema cases there was improvement. The author's general impression is that oleothorax is not an easy method of treatment to manage and requires careful observation and experience but is of distinct value in some cases. He has found that warming the oil to body temperature and using an 18 gage needle and a 20 cc. syringe works well. After each 20 cc. of oil is injected, an equal amount of air should be aspirated and the intrapleural pressure can be determined occasionally by the manometer. When underlying fluid is being aspirated, the patient should be placed in the sitting position and the needle should be inserted low. The intrapleural pressure has to be watched.

Iowa State Medical Society Journal, Des Moines

23: 439-494 (Aug.) 1933

Functions of Anterior Lobe of Hypophysis. D. P. Barr, St. Louis.—p. 439.
Mild and Atypical Cases of Exophthalmic Goiter. W. A. Plummer, Rochester, Minn.—p. 442.
Diagnosis and Management of Toxic Thyroid. T. F. Thornton, Waterloo.—p. 446.
Diagnosis of Myxedema. C. W. Baldridge, Iowa City.—p. 450.
Hyperinsulinism. J. A. Evans, LaCrosse, Wis., and W. McDonough, New York.—p. 454.

Journal of Biological Chemistry, Baltimore

101: 583-808 (Aug.) 1933. Partial Index

Some Considerations on Precise Analysis of Air from Respiration Chambers. T. M. Carpenter, Boston.—p. 595.
Lipid Content of White Blood Cells in Normal Young Women. E. M. Boyd, Rochester, N. Y.—p. 623.
Factors Influencing Measurement of Phosphatase Activity of Tissue Extracts. H. Bakwin and O. Bodansky, New York.—p. 641.
Carotene Content, Vitamin A Potency and Antioxidants of Butter Fat. C. L. Shrewsbury and H. R. Kraybill, Lafayette, Ind.—p. 701.
Dipeptide Phosphoric Acid Isolated from Casein. P. A. Levene and D. W. Hill, New York.—p. 711.
Oxidation of Cystine in Nonaqueous Mediums: II. Studies on Hydration of Acetonitrile and Acetic Anhydride by Nonaqueous Titration Method. T. F. Lavine and G. Toennies, Philadelphia.—p. 727.
Oxidation of Theelin and Some Theelol Derivatives. D. W. MacCorquodale, L. Levin, S. A. Thayer and E. A. Doisy, St. Louis.—p. 753.
Chemical Composition of Active Principle of Tuberculin: XVII. Comparison of Nitrogen Partition Analyses of Proteins from Different Acid-Fast Bacilli and Relationship to Biologic Activity. Florence B. Seibert and Betty Munday, Chicago.—p. 763.
Chemistry of Lipids of Tubercle Bacilli: XXXIV. Isolation of Pigment and of Anisic Acid from Acetone-Soluble Fat of Human Tubercle Bacillus. R. J. Anderson and M. S. Newman, New Haven, Conn.—p. 773.
Relationship Between Gastric Secretion and Alkaline Tide in Urine. R. S. Hubbard, Buffalo; S. A. Munford, Clifton Springs, N. Y., and J. Tyner, Palmyra, N. Y.—p. 781.

Journal of Pharmacology & Exper. Therap., Baltimore

48: 375-504 (Aug.) 1933

*Determination of Toxicity of Neoarsphenamine: I. Increase in Toxicity on Exposure to Air. C. A. Morrell and C. W. Chapman, Ottawa, Ont., Canada.—p. 375.
Id.: II. Determination of Characteristic Curve for Rats. C. A. Morrell and C. W. Chapman, Ottawa, Ont., Canada.—p. 391.
Febrile, Respiratory and Some Other Actions of Dinitrophenol. M. L. Tainter and W. C. Cutting, San Francisco.—p. 410.
Cumulative Poisoning by Squill Derivatives and by Ouabain. E. W. Wallace and H. B. Van Dyke, Chicago.—p. 430.
*Study of Antidotal Action of Sodium Thiosulphate and Dihydroxyacetone in Cyanide Poisoning, and the Alleged Antidotal Action of Glucose. B. B. Turner and H. R. Hulpieu, Indianapolis.—p. 445.
Phosphate-Buffered Injection Medium Disturbance in Caffeine Effects on Voluntary Muscle Response. R. H. Cheney, Brooklyn and Woods Hole, Mass.—p. 470.
Toxicity and Deposition of Thallium in Certain Game Birds. P. A. Shaw, San Francisco.—p. 478.
Narcotic Potency in Paraldehyde Series. P. K. Knoefel, San Francisco.—p. 488.

Increase in Toxicity of Neoarsphenamine.—Morrell and Chapman found that 4 per cent solutions of neoarsphenamine, standing exposed to air for twenty minutes, increase in toxicity as much as 56 per cent, calculated on the basis of solutions five minutes old. Evidence is presented that the increase in toxicity of solutions caused by their preparation and an exposure of fifteen minutes to air is about 107 per cent, calculated on the basis of protected solutions. These increases in the toxicity of neoarsphenamine solutions can be prevented by preparing and keeping them under a layer of white liquid petrolatum. Neoarsphenamine solutions thus protected show no increase in toxicity after standing under oil for one hour, and there is some evidence that no increase in toxicity occurs in two and a half hours. There is a slight decrease in the toxicity of neoarsphenamine solutions kept under oil. This decrease remains constant and is insignificant when compared to large increases shown by unprotected solutions. The alterations in the toxicity of unprotected solutions make it impossible to obtain accurate or consistent results if they are used in toxicity tests. Protected solutions yield consistent and reliable results.

Cyanide Poisoning.—Turner and Hulpieu state that the method of administering a poison in divided doses, each of which is sublethal but which are given rapidly enough to produce an accumulative effect, appears to be more satisfactory than the customary method of giving single lethal doses. Their results with sodium thiosulphate and dihydroxyacetone are in full agreement with those of a number of investigators. The authors were unable to confirm the observations of Forst and others in regard to the value of dextrose as an antidote for cyanide poisoning. Their results in this respect are in agreement with those of Hynd, Heymans and Soenen, and of Rentz, who were unable to demonstrate beneficial effects of dextrose. Their experiments with asphyxia induced by the use of a mask and the experiments in which the lactic acid was determined gave results that would be expected if the main action of cyanide is to depress cellular respiration. The fact that cells in a condition of oxygen want can secure energy by the breakdown of glycogen to lactic acid but are unable to reverse the process, combined with the appearance of asphyxial convulsions, which are almost always produced in cyanide poisoning, accounts for the rapid rise in blood lactic acid. During recovery from oxygen want the cells again regain their ability to convert lactic acid to dextrose or to glycogen, and consequently the lactic acid of the blood rapidly falls to normal, while the dextrose in the blood is more slowly reconverted to glycogen.

Medical Journal and Record, New York

138: 73-108 (Aug. 2) 1933

Posture in Its Relation to Industrial Fatigue. J. R. Garner, Atlanta, Ga.—p. 73.
Bacillus Welchii Infection: Report of Three Cases. D. B. Allman and H. Subin, Atlantic City, N. J.—p. 77.
Smallpox and Immunity. J. A. Mendelson, Tientsin, China.—p. 80.

138: 109-144 (Aug. 16) 1933

Tuberculosis Control in New Haven. H. R. Edwards, New Haven, Conn.—p. 109.
The General Practitioner and Diabetes Mellitus. B. Jablons, New York.—p. 112.
Posture in Its Relation to Industrial Fatigue. J. R. Garner, Atlanta, Ga.—p. 117.

Nebraska State Medical Journal, Lincoln

18: 281-320 (Aug.) 1933

Management of Hepatic Disease. C. A. Elliott, Chicago.—p. 281.
Enemies of the General Practitioner. L. F. Egen, Hastings.—p. 284.
Statistical Study of Six Hundred and Sixteen Cases of Diabetes. F. Conlin, Omaha.—p. 286.
*"Effort" Thrombosis of Subclavian Vein in Puerperium. L. S. McGoogan and E. E. Simmons, Omaha.—p. 289.
Neurologic Problems in Traumatic Cerebral Lesions. A. E. Bennett, Omaha.—p. 293.
Comparative Study of Complications in Ether and Spinal Anesthesia. L. E. Hanisch, Omaha.—p. 298.
Burns and Their Treatment. I. C. Munger, Jr., Lincoln.—p. 300.
Interplay of Science and Practice in History of Modern Medicine. C. M. Wilhelmj, Omaha.—p. 306.
Treatment of Poliomyelitis: Review of Literature. C. R. Spicer, Hastings.—p. 310.

Effort Thrombosis.—McGoogan and Simmons present a case of thrombosis of the veins of the upper extremity in a woman who had been well until her first pregnancy, following which she developed a chronic nephritis and was advised not to become pregnant. Six years later she became pregnant again and was admitted to the hospital one week before delivery, during which time she was under intensive antitoxemic treat-

ment. A classic cesarean section was performed under spinal anesthesia. Salpingotomy was advised but refused. She was delivered of a normal female child weighing 6 pounds (2,720 Gm.). Her convalescence was uneventful except for a gradual fall of the blood pressure with diminution but not actual disappearance of the albuminuria. On the day following her dismissal from the hospital, the fourteenth postoperative day, she noticed a feeling as if she were unable to swallow, then a swelling on the left side of the neck above the clavicle which spread to the left shoulder, accompanied by pain around the shoulder. She then was unable to move her left arm, and the veins on the back of her left hand were distended. There was discoloration and distention of the veins in the axilla, along the course of the long thoracic vessels, and some swelling and discoloration around the left shoulder. The veins of the left upper extremity down to those over the dorsum of the hand were distended. Palpation of the axilla was impossible because of pain. The pulse was 146 and weak. The heart sounds were similar to those heard in a case of pulmonary thrombosis. The temperature was 99.6 F. The swelling gradually descended down the left arm until the entire shoulder region, arm, forearm and hand were edematous and cyanotic. On the seventh day after the onset, the pulse was slower and the patient felt better but she was unable to move the extremity. The edema and cyanosis gradually disappeared and five weeks after the onset of the disturbance the patient was able to move the extremity somewhat and was allowed to get out of bed. When she was up the edema and cyanosis returned to some degree and persisted for another month. The cyanosis disappeared about this time but the swelling persisted for six months. For the past ten months the patient has been able to do her own house work without difficulty. The authors believe that thrombosis was due to the fact that the patient helped lift herself up in bed by holding on to the rods at the head of the bed. Such a maneuver would of necessity entail abduction, extension and probably lateral rotation.

Radiology, St. Paul

21: 105-206 (Aug.) 1933

Pulmonary Changes from Inhalation of Noxious Gases. H. P. Doub, Detroit.—p. 105.
Radium Implantation in Certain Growths of Hypopharynx. D. Quick, New York.—p. 114.
Advantages and Disadvantages of Large Chamber Measuring Apparatus. A. K. Merchant, Philadelphia.—p. 123.
*Roentgen Pelvimetry: Description of Grid Method and Modification. H. Thoms, New Haven, Conn.—p. 125.
*Roentgenography of Acute Bronchopulmonary Diphtheria in Adults. N. Toomey, Palmyra, Mo.—p. 130.
Roentgen-Stereoscopy: Review of Its Present Status. H. A. Jarre, Detroit, and O. E. W. Teschendorf, Cologne, Germany.—p. 139.
Priority in Therapeutic Use of X-Rays. E. H. Grubbé, Chicago.—p. 156.
Roentgenologic Significance of Filling of Ampulla of Vater. J. Friedenwald and M. Feldman, Baltimore.—p. 162.
The Heart in Pulmonary Tuberculosis: Roentgenologic Consideration. E. A. Schmidt, Denver.—p. 167.
Pneumonoconiosis. F. Flinn, Decatur, Ill.—p. 173.
Present Responsibilities in Dental Radiography. C. O. Simpson, St. Louis.—p. 179.
Nasal Accessory Sinus Diseases Clinically and Roentgenographically Correlated. L. W. Dean, St. Louis.—p. 183.
Treatment of Superficial Fungus Infections with Long Wavelength Roentgen Rays (Grenz Rays): Further Observations. M. Dorne and C. White, Chicago.—p. 185.
Estimating Risk of Operations on Biliary Tract by Testing Excretory Function of the Liver. E. A. Graham, St. Louis.—p. 191.

Roentgen Pelvimetry.—Thoms gives a modification of the grid method using the pelviscope, which he describes. The eye of the examiner occupies the position of the target of the x-ray tube and views the developed roentgenogram through a glass centimeter grid placed in the position formerly occupied by the superior strait of the patient. The level of the superior strait for this latter purpose may be determined by means of the plumb bobs or entirely by calipers, measuring from the sensitive film to the points of identification above. He places directly on the sensitive film identification marks (iron washers), which mark the center of the roentgenogram under the target, the point under the symphysis which represents the point of contact of the lower arm of the calipers and the point under the posterior pelvic measurement which represents the point of contact of the lower arm of the calipers in this position. The eyepiece of the observer must be in the same horizontal plane as the center of the developed plate in the viewing box. In other words, the conditions which obtain vertically in making the exposure are made horizontal for convenience. When the developed roentgenogram is viewed, it becomes possible to trace the course of the superior strait directly on the glass grid with a wax pencil; this tracing represents the true superior strait. It may then be traced directly on centimeter paper, which can be filed with the patient's chart. The author states that the pelviscope method has one advantage over the centimeter grid method in that a tracing of the superior strait in its true proportions becomes available.

Acute Bronchopulmonary Diphtheria.—Toomey reports two cases of acute tracheobronchial diphtheria without laryngeal, faucial or nasal symptoms. Both occurred in young adult males, one of the fatal fulminating type, and one of intermediate virulence, with recovery following the employment of antidiphtheritic serum only in large dosage intramuscularly and intravenously, and insulin and dextrose to support the heart. The obscure nature of the ailment, its rarity and the lack of common knowledge concerning it makes early diagnosis unlikely. A rapidly developing toxemia of insidious onset, with pallor, bronchial obstruction, cyanosis or other symptoms of impending circulatory collapse should, especially in the presence of abnormal auscultatory signs over the chest, lead to pseudomembrane in the bronchi being sought for by direct smear, by expulsion (induced coughing) and by roentgenography, despite the absence of inflammation or fibroplastic exudate in the fauces, nasopharynx or larynx. A large proportion of these cases will be recognized early by roentgenography rather than by cultural or bacterial inspection methods, owing to the negative aspect of the fauces, larynx and nasopharynx. The prognosis is grave, virtually fatal for fulminating cases, but, for those of moderate virulence, the prognosis is better than for laryngeal diphtheria of like virulence, provided a correct diagnosis is established within three or four days of onset. A single massive dose of antidiphtheritic serum should be given immediately by intramuscular and intravenous injection, and the heart should be supported by absolute rest, insulin and suitable cardiac stimulants, both primarily and also during the period of delayed cardiac deterioration.

Rhode Island Medical Journal, Providence

16: 113-128 (Aug.) 1933

Diabetic Coma. A. M. Burgess, Providence.—p. 113.
Diet in the Treatment of Diabetes. H. A. Lawson, Providence.—p. 115.
Insulin: Its Use in Diabetes Mellitus. L. I. Kramer, Providence.—p. 117.
Certified Milk. H. Moak, Brooklyn.—p. 123.

Science, New York

78: 131-152 (Aug. 18) 1933

The University of California Botanical Garden Expedition to Western China and Tibet. T. H. Goodspeed, Berkeley, Calif.—p. 144.
*Sodium Tetrathionate and Methylene Blue in Cyanide and Carbon Monoxide Poisoning. J. H. Draize, Laramie, Wyo.—p. 145.
Occurrence of Ixodes Auritulus Neum. in North America (Oregon). C. B. Philip, Hamilton, Montana.—p. 145.
Protective Amputation of Limbs by Stagomantis Carolina. C. C. Guthrie, Pittsburgh.—p. 146.

Antidotes for Cyanide Poisoning.—Draize states that, according to results obtained in his laboratory, two of the various antidotes advocated to treat cyanide poisoning are effective. A dose of from 3 to 4 mg. of a hydrocyanic acid solution per kilogram of body weight is fatal for the rabbit when administered orally. The intravenous injection of from 2 to 3 cc. of a 2 per cent solution of sodium tetrathionate per kilogram of body weight is effective in saving rabbits having received orally three times the minimal lethal dose of hydrocyanic acid. The sodium tetrathionate solution is administered with the onset of the first symptoms of cyanide poisoning. Rabbits tolerate three times the therapeutic quantity of sodium tetrathionate without exhibiting any toxic effects. Methylene blue administered intravenously in the form of a 1 per cent aqueous solution does not afford as much protection. Rabbits receiving more than two times the minimal lethal dose could not be saved. The intravenous injection of quantities in excess of 2.5 cc. of a 1 per cent solution of methylene blue was injurious to the rabbit. In the trial of sodium tetrathionate in

carbon monoxide poisoning, rabbits were gassed to a point from which recovery was impossible without treatment. Sodium tetrathionate was more effective than methylene blue in reviving the poisoned animals.

South Carolina Medical Assn. Journal, Greenville

29: 183-202 (Aug.) 1933

Some Recent Concepts Concerning Essential Hypertension. E. A. Hines, Jr., Rochester, Minn.—p. 186.
Recent Advances in X-Rays as an Aid in Diagnosis. F. D. Rodgers, Columbia.—p. 191.
Late Toxemia of Pregnancy: Analysis and Evaluation of Treatment. R. A. Ross, Durham, N. C.—p. 193.

Southwestern Medicine, Phoenix, Ariz.

17: 251-286 (Aug.) 1933

Some Clinical Observations in Essential Hypertension. L. B. Baldwin, Phoenix, Ariz.—p. 251.
Chronic Tuberculous Veteran. S. H. James, Tucson, Ariz.—p. 255.
*What Orris Powder May Do in the Labyrinth Storm. H. Yandell, Phoenix, Ariz.—p. 257.
Ureteral Obstruction Due to Carcinoma of Uterus. D. M. Davis, Phoenix, Ariz.—p. 259.
Cardiac Infarct with Subsequent Congestive Heart Failure and Cystitis: Case Report. S. H. Newman, El Paso, Texas.—p. 260.
Splenomegaly Simulating Renal Disease: Case Report. K. D. Lynch and R. F. Thompson, El Paso, Texas.—p. 261.
Demonstration of Pathologic Specimen from Autopsy: Pneumonoconiosis. H. P. Mills, Phoenix, Ariz.—p. 262.
Normal Delivery Following Cesarean Section: Report on Two Cases. B. Herzberg, Phoenix, Ariz.—p. 263.
Advanced Pyonephrosis from Large Renal Calculus: Case Report. K. D. Lynch and R. F. Thompson, El Paso, Texas.—p. 264.
Control of Cummunicable Diseases in Public Schools. Gertrude Shaw Cragin, Tucson, Ariz.—p. 265.

Orris Powder in Ménière's Disease.—Yandell reports a case which, he believes, establishes the relationship of orris allergy as an etiologic factor in Ménière's disease. The patient has had periodic attacks of intense vertigo, tinnitus, nausea and vomiting for the past fourteen years. Headaches usually follow these attacks, lasting for several hours. The nasal sinuses have been explored several times without relief. Family history is negative as to any suggestion of allergy. The patient gives a history of having had urticaria and hives. He states that attendance at theaters, dances and crowded places seems to provoke attacks. He states that he has never had a discharge from the ear. Roentgenograms show no pathologic changes in the sinuses or lungs. Sputum, Wassermann, genito-urinary, urine and blood tests were all normal. Intradermal and epidermal food tests were negative. House dust was plus two and orris root plus four. The author used 0.02 cc. of a 1:500 dilution of orris. Severe headache, nausea and vomiting occurred, and the patient had to be placed in a reclining position to prevent falling. This condition lasted about six hours. The patient was given daily doses of weak solutions of orris until a tolerance for a 1:500 solution was established. He now can tolerate as much as 0.05 cc. of 1:100 solution. He feels much improved physically and mentally and does not have the attacks when he attends shows or dances and when he visits barber shops. He has been taught the use of the extract and gives himself intradermal injections whenever he needs them.

Western J. Surg., Obst. & Gynecology, Portland, Ore.

41: 427-484 (Aug.) 1933

Thyroid Deficiency, Commonly Unrecognized Disorder. C. H. Mayo, Rochester, Minn.—p. 427.
Iodine in Thyroid Gland. W. O. Thompson, Phebe K. Thompson, Lois F. N. Dickie and S. G. Taylor III, Chicago.—p. 431.
Water Balance in Patients with Hyperthyroidism. F. A. Coller and W. G. Maddock, Ann Arbor, Mich.—p. 438.
Morphogeographic and Experimental Studies on Etiology of Goiter. C. A. Hellwig, Wichita, Kan.—p. 453.
Life Cycle of Thyroid Cell and Its Relation to Goiter. B. Markowitz, Bloomington, Ill.—p. 463.

West Virginia Medical Journal, Charleston

29: 329-364 (Aug.) 1933

Preventive Medicine from the Family Physician. H. F. Vaughan, Detroit.—p. 329.
Otodynia: Diagnosis and Treatment. R. S. Wolfe, Elkins.—p. 340.
The Hypothyroid Heart. W. C. Swann, Huntington.—p. 346.
Intrathoracic Tumors. M. I. Mendeloff, Charleston.—p. 350.
Acute Back Injuries. T. T. Bagwell, Welch.—p. 352.
Trichomonas Infection of Kidney Pelvis: Case. A. C. Madsen, Elkins.—p. 356.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Archives of Disease in Childhood, London

8: 227-290 (Aug.) 1933

Studies in Anemias of Infancy and Early Childhood: Part VI. Nutritional Anemia in Mother and Child. A. V. Neale and J. C. Hawksley, p. 227.
Id.: Part VII. Monocytic Reaction in Myelosis. R. Gittins and J. C. Hawksley.—p. 241.
*Factors Causing Variation in Hemoglobin Level with Age in the First Year of Life. Helen M. M. Mackay.—p. 251.
Renal Rickets Associated with Parathyroid Hyperplasia. F. S. Langmead and J. W. Orr.—p. 265.
Occurrence of Sex-Linked Variations in Twins. C. E. Kellett.—p. 279.

Variation in Hemoglobin Level.—Mackay describes the usual variations in hemoglobin level during the first year of life relating to their causal factors. Some of the conclusions are tentative. The high hemoglobin level of the new-born infant is known to be related to the low oxygen tension of the blood of the fetus in utero and its consequent need of a relatively greater amount of hemoglobin. After birth there is a fairly rapid destruction of red cells, and the more fragile immature cells which are present in greater proportion in the blood of immature infants are destroyed early. Hence there is a rapid fall in hemoglobin in the first week of life, greater in small than in large infants. This destruction causes a further increase in blood bilirubin and may give rise to an icteric tinge of the skin (physiologic jaundice). During this stage of physiologic blood destruction the production of red cells is presumably decreased, as shown by the small number of reticulocytes in the blood of normal infants between the ages of 1 and 4 weeks. The drop in the red cells continues until about the third month of life. The evidence available again points to an increase in the production of red cells between the ages of 5 and 8 weeks, though it does not usually exceed destruction till the third or fourth month. Iron derived from hemolysis of red cells in the early weeks of life augments the original store present in the liver and spleen at birth and is utilized during the period of a rising hemoglobin level, between the third and sixth months of life. This store, however, quickly becomes depleted, especially in infants whose rate of growth has been rapid, and consequent iron deficiency often retards the rise and usually causes a slow drop in hemoglobin level after the sixth month of life. Toward the end of the first year of life, a slow spontaneous rise in hemoglobin level may again occur, resulting from increased iron intake due to a mixed diet.

British Journal of Physical Medicine, London

8: 53-68 (Aug.) 1933

Treatment of Lupus of Mucous Membrane by Artificial Sunlight. E. Wessely.—p. 55.
*Ambulatory Treatment of Lupus by Light, Diathermy and Diet. S. C. Dalsgaard.—p. 56.
Diagnosis and Treatment of Secondary Intestinal Tuberculosis. L. Brown and H. L. Sampson.—p. 58.
Therapeutic Uses of Alpine Climate. B. Hudson.—p. 62.
Therapeutic Indications for the Kromayer Lamp. E. Kromayer.—p. 65.

Treatment of Lupus.—Dalsgaard describes an ambulatory treatment of lupus in which the patch is carefully cleansed with oil and ether to free it from all scales and crusts, so that the individual nodules and cicatrizations stand out clearly. Then follows a diathermy treatment, "spark painting." In this method the active electrode, a spatula about 3 mm. wide (the patient holds the inactive one in his hand), is applied to the affected area so as to produce a shower of "microscopic" sparks between it and the electrode, giving the patch the appearance of having been painted with a diluted silver nitrate solution. When ulceration is present, the electrode is applied more deeply and the undermined margins in particular are carefully treated. This treatment can be borne by the patient without narcotics and anesthetics, and it should be repeated when the reaction following the previous treatment subsides and when the progress made can be gaged. On alternate days the author exposes the patient to the sun lamp at the shortest distance that can be borne painlessly. The first exposure is given immediately after the first diathermy treatment, which lasts for half an hour, this being increased to one hour at subsequent treatments. The affected part turns a flaming red immediately after this treat-

ment. The sore is then bandaged and a neutral ointment applied. The patient is instructed to take foods rich in vitamins and poor in animal albumin, two viosterol tablets and nine calcium tablets of 1 Gm. each. The viosterol may be replaced by cod liver oil.

British Medical Journal, London

2: 181-222 (July 29) 1933

The Family Physician's Rôle in Prevention of Mental Disorder and Defect. H. R. C. Rutherford.—p. 188.
Viruses and Skin Diseases. R. T. Brain.—p. 191.
Nasal Granulomas. P. Dempsey.—p. 194.

Lancet, London

2: 223-278 (July 29) 1933

Work of the British Medical Association in Ireland. T. G. Moorhead.—p. 223.
*Dermal Strain of Vaccinia Virus Grown on Chorio-Allantoic Membrane of Chick Embryos: Possible Large Scale Production of Bacteria-Free Virus. W. D. H. Stevenson and G. G. Butler.—p. 228.
*Adolescent Hypertension with Excretion of Adrenalin-Like Substance in the Urine: Case. J. C. Hoyle.—p. 230.
*Pathologic Diagnosis of Female Gonorrhea. W. N. Mascall.—p. 233.

Cultivation of Bacteria-Free Vaccinia Virus.—In Stevenson and Butler's technic, fertile eggs are used after an incubation period of ten or eleven days. The air sac is marked off and an area chosen and marked over what appears to be, by transmitted light, the membrane of the embryo in such a position as to be well within the shadowed portion but yet away from the darkest area. The egg is placed on a stand so that the air sac end is submerged in a water bath at from 38 to 40 C. The shell over the chosen area is rubbed with alcohol and allowed to dry. Disinfection of the shell with tincture of iodine can be carried out with safety. All instruments are dipped in alcohol and flamed. With the sharp point of scissors or scalpel a small hole is drilled in the shell, damage to the shell membrane being avoided. If the shell membrane is not perforated during this procedure it is incised, but no attempt is made to damage the chorion by pricking in the manner advised by Woodruff and Goodpasture, for the authors found that death of the embryo may be caused in this way. The inoculum is drawn up into a sterile fine capillary pipet and a column of about 1 to 1½ inches injected below the shell membrane obliquely on to the surface of the chorio-allantoic membrane, when often it may be noticed that the movements of the embryo actually suck in any of the inoculum that may be left at the margin of the hole. The shell opening is closed with melted hard petrolatum—sterile and not too hot, and near to the point of solidification. The eggs are dried, marked with identification numbers and dates, returned to the incubator, turned morning and evening and allowed to cool off every day for fifteen minutes. Incubation is continued for four days, after which the eggs are opened: the upper third to half of the egg toward the more pointed end is dipped in alcohol and flamed and the shell is opened aseptically in that area; the chorio-allantoic membrane is incised with scissors and the contents within that membrane may drop out or be drawn out with forceps, leaving as a rule the chorio-allantoic membrane attached within the shell, from which it can be separated with ease. So far as the authors' experiments indicate and as Woodruff, Goodpasture and Buddingh hoped, a vaccine may be produced at little expense absolutely free from contaminating micro-organisms, apparently capable of producing on the rabbit lesions comparable to those produced by calf vaccine, and, so far as observed, nonhemorrhagic. The chick membrane virus retains its potency at least two months in glycerin if kept below 0 C. The experience of the authors is that, unless interfered with deliberately, chicks usually hatch out from the inoculated eggs at maturity, and healthy chicks result. Examination of the membranes left in some of the hatched egg shells show that the membranes really were infected—in some cases heavily so. Actually, from twenty-one inoculated eggs permitted to mature, twenty-one chicks have hatched out. Two died subsequently, but it should be noted that they were reared under necessarily artificial conditions. This experience contrasts with the observations of Woodruff, Goodpasture and Buddingh, who state that infected chick embryos usually die on the fourth day after inoculation. This may be due to the difference in the strains of virus employed—in the authors' case, dermal; in their case, neurotesticular. They add that, when eggs are opened on the fourth day after inoculation, occasionally a dead embryo has been found, presumably as a result of the operation or from the infection; for example, out of forty-nine inoculated eggs that were opened, two contained dead embryos.

Adolescent Hypertension.—Hoyle describes a case of adolescent hypertension in which a pressor substance, related to epinephrine physiologically was excreted in the urine. They suggest that the case may be an example of high blood pressure resulting from an acquired or inborn error of metabolism.

Diagnosis of Female Gonorrhea.—Mascall analyzes the results of investigations, performed on the first attendance of the patient, in 500 consecutive cases of gonorrhea definitely diagnosed by means of (1) smears, (2) cultures, and (3) the gonococcus complement fixation test of the blood serum. These methods were used as a routine and no case was labeled as gonorrhea unless or until pathologic tests proved the presence of the gonococcus; clinical observations alone were considered insufficient. Cultures produced the highest number of positive results (66.8 per cent). The value of the gonococcus complement fixation test, as shown by this series, is second (58.6 per cent positive results), but the corrected figure, 79.6 per cent when the latest technic is used, places this test first. It has a definite place among the diagnostic methods of gonorrhea, but the clinical history and condition must be closely considered when the result of the reaction is being interpreted. In many cases it is indispensable, as 142 cases (20.8 per cent) were discovered which otherwise would not have had their true nature revealed. Smears alone, even when stained with Gram's stain, give poor results (45.4 per cent), as no less than 54.6 per cent are overlooked. This figure is even greater if methylene blue is the only stain employed. Whenever possible, the three methods should be combined. The results from one method alone may not be dependable. In gonococcic infections, errors in diagnosis may lead to such serious consequences both for the patient and for the medical attendant, and the underlying cause of the trouble is frequently so elusive, that every possible method of diagnosis should be used that the proportion of mistakes may be reduced to a minimum.

Medical Journal of Australia, Sydney

2: 131-166 (July 29) 1933

Pneumonoconiosis. W. A. Edwards.—p. 131.
Renal Pain and Nephropexy With or Without Resection of Renal Nerves. M. G. Sutton.—p. 135.
Treatment of Carcinoma of Uterine Cervix. R. Fowler.—p. 144.

Quarterly Journal of Medicine, Oxford

2: 281-462 (July) 1933

Diseases Associated with Pernicious Anemia: Study of Three Hundred and Seventy Cases. J. F. Wilkinson.—p. 281.
*Comparative Value of Drugs Used in Continuous Treatment of Angina Pectoris. W. Evans and C. Hoyle.—p. 311.
Fatty Diarrhea, with Especial Reference to Nitrogen Metabolism: Two Cases. A. G. Anderson and A. Lyall.—p. 339.
Diabetes Mellitus and Pregnancy: Clinical and Analytic Study, with Especial Observations on Thirty-Three Cases. E. Skipper.—p. 353.
*Effect of Yeast and Wheat Embryo in Anemias: I. Marmite, Yestamin and Bemax in Megalocytic and Nutritional Hypochromic Anemias. C. C. Ungley.—p. 381.
Xanthomatosis Generalisata Ossium. I. Snapper and C. Parisel.—p. 407.
*Acid-Base Equilibrium of Blood in Epilepsy. F. L. McLaughlin and R. H. Hurst.—p. 419.
Achlorhydria. T. H. Oliver and J. F. Wilkinson.—p. 431.

Comparative Value of Drugs in Angina Pectoris.—Evans and Hoyle observed a series of ninety patients with angina pectoris of effort over a period of two and a half years, with especial reference to the comparative value of certain drugs used in continuous treatment. Syphilitic angina pectoris was excluded, and coronary thrombosis was considered only as a complication. Each patient attended fortnightly, and the various drugs were administered over periods of from two to four weeks or longer. In this way their effect on the frequency and severity of attacks could be compared. As a control in each case a patient receiving placebo treatment was regularly substituted for an active drug. The following drugs were tested: sodium nitrite, mannitol hexanitrate, erythrol tetranitrate, potassium iodide, phenobarbital, chloral, morphine, papaverine, acetphenetidin, theobromine sodiosalicylate, theophylline ethylenediamine, belladonna, digitalis, lacarnol and harmol. With one exception,

the results show that a measure of improvement appears to result from every remedy tried, and at least as great an improvement as during placebo treatment. This universal efficacy can be explained only by natural variations in the severity of the symptoms, which give a spurious value to each remedy. There was some reason to think that chloral, morphine, papaverine and acetphenetidin had a trifling influence in controlling the group incidence and severity of attacks. If, as the authors are convinced, none of these remedies are capable of lessening the frequency or severity of anginal attacks, there is all the greater need for a study of the application of those general measures known to control them, and to promote the wider use of vasodilators, such as glyceryl trinitrate, which are so often successful in the palliative treatment or even in the prevention of particular attacks.

Effect of Yeast and Wheat Embryo in Anemias.—Ungley found that, in idiopathic hypochromic anemias with or without achlorhydria and whether or not the diet has been grossly defective, no effect on hemoglobin regeneration has followed the administration of massive doses of preparations of yeast or wheat germ. The experiments of Parsons suggest that yeast as well as iron may be indicated in the nutritional hypochromic anemias of pregnancy. In two patients with atypical pernicious anemia showing an incomplete defect in the secretion of hydrochloric acid combined with a gross dietary deficiency and associated in one case with dysphagia of the Plummer-Vinson type, the administration of preparations of wheat germ and autolyzed yeast was followed by a hematopoietic response. Of ten cases of classic pernicious anemia treated with preparations of yeast and wheat germ, seven showed a response and three failed to respond. Wheat germ gave an uncertain positive result in one case and negative results in two others. Autolyzed yeast or an extract derived from autolyzed yeast gave positive results of a greater or lesser degree in six of seven cases. One patient who failed to respond to autolyzed yeast failed also to respond to dried brewers' yeast. In classic pernicious anemia and in two cases of atypical pernicious anemia, the responses were usually less in degree than those obtained from autolyzed yeast in certain megalocytic anemias without achlorhydria. From the therapeutic point of view, the variable and usually submaximal results obtained with doses as large as can be tolerated indicated that none of the preparations used are satisfactory substitutes for liver in the relapse stage of pernicious anemia. On the other hand, the responses so far obtained from a 65 per cent alcoholic extract of autolyzed yeast suggest that an inexpensive product suitable for the treatment of pernicious anemia may yet be obtained from yeast. The author discusses the possibility that preparations of yeast may owe their potency in pernicious anemia to: (1) the extrinsic factor, (2) a breakdown product of the extrinsic factor perhaps resulting from the interaction of this substance with an enzyme liberated during the autolysis of yeast, or (3) a substance resembling the "liver active principle."

Acid-Base Equilibrium of Blood in Epilepsy.—McLaughlin and Hurst studied the acid-base equilibrium of the blood in epilepsy, estimating the measurements of the blood p_H, the alkali reserve and lactic acid. The results suggest that in the interval period between fits: 1. Variations in the alkali reserve and lactic acid are usually within normal limits, but those of the p_H extend to a range slightly above normal. 2. The average concentration of lactic acid is normal. The average alkali reserve and p_H values tend to be slightly above normal. The averages of the results obtained for the alkali reserve and p_H during the two-hour period preceding the fit show no significant difference from those of the interval period. Results obtained from samples of blood of individual patients before, during and after seizures lead to the following conclusions: 1. There is a fall in the alkali reserve during and for varying periods after the fit, this fall being accounted for by the accumulation of lactic acid in the blood. A decrease in the lactic acid during recovery is accompanied by an increase in the alkali reserve. 2. The blood p_H falls during the fit, owing first to apnea during the tonic stage and then to the production of lactic acid during the clonic stage. Recovery to the normal p_H is of more rapid occurrence than is the case with normal persons after exercise.

Archives des Maladies de l'Appareil Digestif, Paris

23: 801-912 (Oct.) 1933

Complication of Gastro-Entero-Anastomosis: Transitory Stenosis of Mouth of Anastomosis. P. Bernay and R. Peycelon.—p. 801.
Action of Insulin on Gastric Secretion. J. Hofstein.—p. 808.
*Elimination of Neutral Red by Gastric Mucosa: Clinical Value of Method. J. Held.—p. 827.

Elimination of Neutral Red by Gastric Mucosa.—Held states that the chromoscopic test based on the power of the gastric mucosa to eliminate neutral red injected into the muscles has a great value in the differential diagnosis and prognosis of gastric lesions. On the basis of 160 chromoscopic tests associated with repeated examinations of the gastric contents after the caffeine test meal, he concludes that the normal gastric mucosa eliminates the dye in from twelve to twenty-four minutes after injection. In hyperchlorhydria the elimination is accelerated (from four to fourteen minutes), while in hypochlorhydria it is retarded (from twenty-six to forty minutes). Although elimination is more rapid in hyperchlorhydria and less rapid in hypochlorhydria, there is no parallelism between the degree of acidity and the speed of elimination of the dye. If elimination of the dye by the kidney is impeded owing to renal disease, there is a compensatory acceleration of the elimination by the gastric mucosa, independent of the gastric acidity. In gastritis the elimination of neutral red is retarded if the gastric acidity is normal. The quantity of mucus influences the retardation, aside from any glandular lesion. The elimination of the dye is increased in gastric or duodenal ulcer as in other conditions evolving with hyperchlorhydria. The chromoscopic test is above all useful for the diagnosis of conditions of gastric hyposecretion: the elimination is greatly retarded or lacking in achlorhydria due to organic lesions of the gastric mucosa, while it is not affected in psychic achlorhydria. The chromoscopic test is superior to the histamine test for determining the secretory function of the gastric mucosa in achlorhydria. In cases in which neutral red is not eliminated the histamine test is likewise negative, whereas occasionally when the histamine test is negative the mucosa retains the power of eliminating the dye. The injection of histamine simultaneously with neutral red hastens the elimination of the dye by the gastric mucosa, and in certain cases with a negative chromoscopic test it causes the dye to appear in the stomach: this represents the final effort of the gastric mucosa. The diagnosis of a permanent gastric lesion cannot be made after a single chromoscopic test; it requires periodically repeated tests. In eleven cases of cancer of the stomach the chromoscopic test was negative six times, mostly in cases in which the cancer was localized in the pyloric region; in cancer limited to the body of the stomach the power of eliminating the dye is often retained rather long. In doubtful cases, progressively deficient elimination of the dye favors cancer and increasing rapidity of elimination militates against it. In all cases of pernicious anemia there was total achylia and the chromoscopic test associated with histamine was negative, indicating atrophy of the gastric mucosa.

Presse Médicale, Paris

41: 1497-1512 (Sept. 30) 1933

Lipomas of Labium Majus. H. Mondor and A. Sicard.—p. 1497.
Neuralgia of Pudendal Nerve. J.-A. Chavany, H. Welti and A. Chaignot.—p. 1498.
*Santonin Test of Antitoxic Function of Liver. A. Moukhtar and Hadidjé Djévat.—p. 1501.

Santonin Test of Antitoxic Function of Liver.—Moukhtar and Djévat test the antitoxic function of the liver by administering santonin and studying its elimination in the urine in the form of oxysantonin. The fasting patient is given 0.02 Gm. of santonin orally and thereafter the urine is collected every hour for nine hours. Three cubic centimeters of urine from each specimen is put in test tubes and to each is added 2 cc. of a solution of sodium hydroxide diluted with equal parts of water. This causes the oxysantonin, which is present in the urine and which is yellow, to turn red. Each tube is compared with a set of six graduated standards prepared with eosin. The preparation of the standards is described by the author. In normal persons the elimination of the oxysantonin starts at the end of one hour and increases progressively to attain its maximum toward the fourth hour. At this hour the concentra-

tion usually reaches the second or at most the third degree, the weakest concentration being represented by the first degree. Thereafter the concentration diminishes steadily to the seventh or ninth hour. In persons with hepatic disease the curve assumes different characteristic forms. Often the elimination attains its maximum more rapidly than normal and this concentration is maintained with slight oscillations for many hours (from nine to fourteen). In other cases the elimination of the oxysantonin is irregular; after reaching a high concentration it drops suddenly to a low concentration, only to return again to a still higher degree than previously. These two modifications must be considered due to disturbances of the hepatic function. Retarded oxysantonin elimination in patients with normal hepatic function occurs only in rare cases of retarded absorption of santonin. Weak or abundant elimination is not encountered in normal patients. The patient should drink a little water during the test, but not more than half a glass. In patients with nephritis this test is not always reliable. The authors have employed the test in 250 cases. Sometimes it was the only one that furnished a positive result in manifest hepatic disease. Repeated at intervals, it gives important prognostic indications.

Policlinico, Rome

40: 1559-1598 (Oct. 2) 1933. Practical Section

Frequency of Increase of Volume and Consistency of Prostate, of Inflammatory Nature in Patients with Diseases Due to Focal Infections: Bacteriologic Observation of Prostatic Fluid. F. Corelli.—p. 1559.
*Disinfection of Skin of Surgical Patients with Malachite Green. E. Fiorini.—p. 1563.
Ivory Vertebra: Case. M. Bottaliga.—p. 1567.
Fracture of Arch of Fifth Lumbar Vertebra with Syndrome of Cauda Equina. A. Tattoni.—p. 1570.
Triennium of Antidiphtheritic Vaccination in Infantile Population. G. Tosi and A. de Mitri.—p. 1573.

Disinfection of Skin with Malachite Green.—Fiorini tested the relative merits of malachite green as a disinfectant on the skin and in culture and found that it had a strong bactericidal effect. Since malachite green shows bactericidal power in a simple saturated aqueous solution, the disinfecting power of alcoholic solutions must be due to the aniline dye. Malachite green dissolved in high grade alcohol at a concentration equal to that of tincture of iodine has a disinfecting power slightly less than that of tincture of iodine. The bactericidal power of solutions of malachite green grows with the increase of concentration of the dye and, up to a certain limit, with the diminution of the grade of the alcohol. The solution of malachite green best adapted to the skin of surgical patients (greatest bactericidal power and least irritating action) has a concentration of not less than 10 per cent in 40 per cent alcohol. In all the author's patients, after disinfection with malachite green as well as with tincture of iodine, the isolated germs responded negatively to Dreyer's test and thus were not capable of causing suppuration. In preoperative disinfection with malachite green, the cicatrization of the wound is facilitated by the elimination of all irritative factors usually observed after application of tincture of iodine. In the disinfection of very sensitive parts, such as the external genitalia, a solution of malachite green with a low degree of alcohol prevents any disturbing irritation.

Rivista Italiana di Ginecologia, Bologna

15: 351-445 (Aug.) 1933

Quantity of Glycogen of Fetal Placenta and Liver in Normal and Pathologic Cases. G. T. Rao.—p. 351.
*Indican of Blood in Tumors of Uterus and Ovary Previous to and After Operation. A. Salvini.—p. 371.
Etiology and Treatment of Late Hemorrhages During Confinement. M. Macciotta.—p. 395.
Importance of Constitutional Factor in Development of Striae of Pregnancy. E. Ponzi.—p. 413.
Function of Reticulo-Endothelial System in Puerperal Infections. G. Tata.—p. 423.
Quantitative Variations of Group Specific Properties Following Ether Anesthesia. E. Ponzi.—p. 439.

Indican of Blood in Tumors of Uterus and Ovary.—Salvini examined thirty-five patients, twenty-four of whom had fibromyomas of the uterus, ten ovarian cystic tumors and one both uterine fibromyomas and parovarian cysts. Examination of the urine of all patients previous to surgical intervention was constantly negative for indican. The author found that the rate of indicanemia increased after operation for tumors of the uterus and of the ovary. In hyperindicanemia much importance has been attributed to a deficient renal excretory function, even when clinical signs of renal disease were not manifest. Hyperindicanemia in uterine and ovarian tumors might be ascribed to a functional deficiency of the liver, particularly to a deficiency in the elaboration of glycuronic acid. The author maintains that a high degree of indican found before operation in the blood of patients having tumors of the uterus and of the ovary is due to insufficient renal function. He states that in these patients the higher amount of indican in the blood during the first few days after operation results from the renal insufficiency and from the intestinal paresis existing in all cases and tending to increase the putrefactive processes of the intestine. The examinations made during the last days of convalescence of the patients showed a steady diminution of the indicanemia. If it is admitted that hyperindicanemia in tumors of the uterus and ovary is due to renal functional insufficiency, it must also be acknowledged that, with the removal of the neoplasm, the influence exercised by it on the kidney ceases. In all cases the rate of indican steadily diminished after operation until it gradually disappeared. In determination of urinary indican the author always found normal values ranging from 10 to 20 mg. per thousand cubic centimeters. The values of indicanemia never ran a parallel course in the sense that a hyperindicanemia corresponded to a hyperindicanuria. The author concludes that hyperindicanemia is indicative of deficient renal function and corresponds to a diminution in the amount of indican in the urine.

Brasil-Medico, Rio de Janeiro

36: 635-652 (Sept. 9) 1933

*New Serologic Variety of Shigella Dysenteriae. A. de Assis.—p. 635.
Acute and Subacute Neuromyelitis: Case. A. Austregesilo.—p. 640.
Syphilis of the Sclera: Case. W. Belfort Mattos.—p. 643.

New Serologic Variety of Shigella Dysenteriae.—De Assis states that he isolated an organism with some of the characteristics of Shigella ambigua from a specimen of feces of a patient suffering from acute febrile dysentery. It was a gram-negative, rod shaped, nonmotile bacillus which acidified dextrose, produced indole and sulphuric acid, and was inactive in lactose and mannite. However, it did not cause agglutination of Shiga, Flexner-Hess, Kruse-Sonne and Schmitz typical dysenteric antiserums. That the organism was not a nonagglutinant type of Shigella ambigua was proved by the fact that the blood serum of rabbits inoculated with it had a high agglutinating power for the respective antigen germ. A comparative study of the typical Shigella ambigua and the isolated bacillus gave the following results: The newly found organism invariably acidified, without forming gas, galactose, sorbitol, rhamnose and glycerin, all of which are not made acid by Shigella ambigua. On the other hand, Shigella ambigua acidified adonitol and sucrose, which are not acidified by the new organism. When the new organism was added to bromo-cresol-purpura milk it proved to be inactive, except for producing a slight initial acidification of the milk. When Shigella ambigua was added to the same milk there was an intense late alkalinization. The new bacillus has been compared only with Shigella ambigua and not with other types of Shigella dysenteriae. However, the serologic differences of the organism are so marked that the author considers it a new and entirely independent subgroup of the Shigella ambigua group, not previously reported. The author proposes to designate the new organism as the Caxambú variety of Shigella ambigua, because the feces from which the organism was isolated came from a woman who lived in Caxambú, Minas.

Día Médico, Buenos Aires

6: 149-168 (Sept. 11) 1933

*Volkmann's Contracture Treated by Periarterial Sympathectomy: Case. A. F. Landívar and C. A. Leoni Iparraguirre.—p. 151.
Roentgen Image of Sylvian Aqueduct in Tumors of Cerebellopontile Angle. R. Carrillo.—p. 158.
Diathermocoagulation of Tonsils. J. M. Carbone.—p. 161.
Pararheumatismal Tuberculous Pleurisy: Case. R. Pardal.—p. 163.

Volkmann's Contracture Treated by Periarterial Sympathectomy.—Landívar and Leoni Iparraguirre report the case of a woman, aged 21, who suffered a fracture of the distal end of the radius of the right arm, with the formation of a hematoma and total backward displacement of the radial epiphysis. Two

days later and while some attempts to reduce the fracture were being made, slight symptoms of Volkmann's contracture were observed. The consolidation of the fractured bone was obtained. Four months after the fracture had occurred, the patient showed a typical Volkmann contracture of the hands and fingers with retraction of the flexor and pronator muscles. All bloodless and orthopedic treatments failed. Humeral arteriectomy (for a length of 10 cm.) was followed by the complete disappearance of the contracture. The patient obtained complete functional recovery, and the appearance of the hand and arm is now normal, two years after the operation.

Semana Médica, Buenos Aires

40: 577-652 (Aug. 31) 1933. Partial Index

*Ischemic Necrosis of Proximal Portion in Intracapsular Fracture of Neck of Femur: Case. J. Arce and A. S. Introzzi.—p. 577.
Metastatic Abscess of Lung in Nursling: Case. J. C. Navarro and F. A. Bourdet.—p. 596.
Acute Amebic Enterocolitis in Children: Three Cases. R. Cibils Aguirre and E. J. Saubidet.—p. 608.
Changes of Electrocardiogram Following Penetrating Wound of Heart. P. Cossio, W. Tejerina Fotheringham, M. Vega and J. González Sabathié.—p. 612.
Acute Edema of Lung in Pregnant Cardiac Women: Two Cases. J. Bazan and M. Mordeglia.—p. 617.
Roentgenography of Uterus in Diagnosis of Causes of Metrorrhagia. C. Heuser.—p. 622.
Urethropubic Fistula: Case. R. Pini and C. Zerbini.—p. 639.

Necrosis in Intracapsular Fractures of Neck of Femur.—Arce and Introzzi state that partial or total necrosis of the femoral epiphysis is a grave complication of transcervical and subcapital fractures. Early diagnosis and treatment of this complication are important to prevent the development of deforming arthropathy followed by invalidism. It is advisable to perform a roentgen examination of transcervical and subcapital fractures every two weeks after the fracture has been reduced and while the limb is immobilized in order to detect, as soon as possible, the appearance of necrosis. In necrosis, the implantation of an aperiosteal graft from the fibula into the neck, followed by a period of prolonged rest, gives satisfactory results. The period of rest should not be discontinued until the roentgen examination shows that restitution of the structure of the femoral epiphysis has taken place. In cases in which necrosis has advanced so far as to produce a grave arthropathy, Whitman's operation is indicated. This operation, however, should not be performed as long as the mobilization of calcium salts, characteristic of these pathologic conditions of the femur, is taking place. The myelosis observed in cases of necrosis complicating femoral fractures should not be considered to be caused by an irritating action of the graft on the bone but rather as a manifestation of intense disturbances of the local metabolism of nutrition of the bone involved. That the graft is not the cause of myelosis in these cases is proved by the fact that myelosis has been reported in various cases of the complication, whether a graft has been used or not, and that similar myelotic changes appeared in certain points of the bone remote from the seat of the implantation in cases in which a graft was used. The authors report a case.

Archiv für klinische Chirurgie, Berlin

176: 197-400 (Sept. 20) 1933

*Experimental Studies on Influence of Partial Gastric Resection on Bacteriology and Chemistry of Small Intestine and Its Clinical Significance. E. Hertel and F. Sartorius.—p. 197.
*Rôle of Pyloric Glands in Secretion of Gastric Juice. T. Straaten.—p. 236.
*Delayed Blood Coagulability in Obstructive Jaundice. A. Barlik.—p. 252.
Symptomatology of Enterocystoma. K. Kettel.—p. 292.
Mechanical Causes of Stasis in Diseased Gallbladders. O. Maier.—p. 310.
Practical Significance and Indication for Bone Transplantation. T. von Matolcsy.—p. 319.
Bone Sarcoma and Its Definition. G. E. Konjetzny.—p. 335.
Isolated Subcutaneous Rupture of Pancreas. S. von Szacsvat.—p. 398.

Effect of Gastric Resection on Bacteriology of Intestine.—Hertel and Sartorius studied the bacterial content of the small intestine in dogs after partial gastric resection by means of fistulas performed at various levels. They observed in the upper and middle portions of the intestine a marked increase in the number of the bacteria as well as a qualitative change; namely, an invasion by the organisms from the large intestine. The change in the bacterial count seemed to depend to a certain extent on the nature of the nourishment and the acid phase of secretion produced by it. The authors made determinations of indole and of iodine binding aromatic products of decomposition and of acids. Constant differences, as compared with normal control animals, were obtained with indole determinations and to a less extent with indican, which seemed to run a parallel course with the former. An exclusive meat diet gave the highest indole content, especially after the second Billroth method of resection. A diet of milk, whey and especially that of sour milk produced insignificant amounts of indole. An attempt was made to correlate these observations with postoperative disturbances after a partial gastric resection, such as dyspepsia, enteritis, anemia and the effect on the general state. Fermentation tests with chyme showed that even in the upper segments of the intestine there developed fermentative processes and decomposition of the character one sees in dyspepsia. This condition may cause an enteritis, which in its turn may cause autointoxication. The postoperative digestive disturbances may lead to secondary and even to pernicious anemia. The mild neurasthenic disturbances observed after resections have their foundation in organic alterations.

Pyloric Glands and Secretion of Gastric Juice.—Straaten states that in his experiments sham feedings failed to evoke high acid values in dogs with esophageal fistula when the segment of the stomach containing the pyloric glands was resected. When the pylorus was left but the rest of the stomach containing pyloric glands was removed, low acid values resulted from sham feedings. After a considerable time, however, high acidity could be provoked by sham feedings. It was only after a considerable lapse of time after the resection that sham feedings were capable of inducing low acid values when the pylorus and the portion containing pyloric glands were resected. The author concludes that the so-called first or psychic phase of gastric secretion is capable of producing high acid values only when some of the pyloric glands have been retained. He further concludes that the gastric segment containing the pyloric glands is capable of stimulating gastric secretion not only through mechanical and chemical stimuli, as formerly believed, but through psychic influences as well. The latter is a reflex phenomenon resulting in the secretion of a hormone which is transported by the blood to the fundal glands. These experiments justify partial gastric resection as therapy for the peptic ulcer, especially if one accepts the rôle of the psychic secretion in the genesis of the ulcer.

Delayed Blood Coagulability in Obstructive Jaundice.—Barlik ligated the common bile duct in rabbits and found that this was followed in a few days by jaundice and delayed blood clotting. The plasma of such an animal was found to possess antithrombin, antiprothrombin and anticomplement properties. Cholemic serum when heated to 56 C. was found to possess greater antithrombin property than similarly treated normal serum. At 70 C. this antiprothrombin property was lost. The activity of prothrombin was found to be delayed in cholemic plasma. The author was able to increase the coagulability of the cholemic blood and plasma by acidifying the blood, through addition of chloroform or of carbon dioxide. He concludes that delayed blood clotting in experimental obstructive jaundice is due to increase in the blood content of antiprothrombin.

Deutsche medizinische Wochenschrift, Leipzig

59: 1419-1452 (Sept. 15) 1933

Saprophytes of Milk and Their Significance. G. Bessau.—p. 1419.
Addictions. K. Schneider.—p. 1423.
Intracapsular Extraction of Senile Cataract. A. Elschnig.—p. 1426.
Idem. W. Stock.—p. 1427.
*Tolerance for Ascorbin Acid (Crystallized Vitamin C) During Nursling Age. E. Kramár.—p. 1428.
*Allergic Manifestations Produced by Stimulants: Their Treatment. M. J. Gutmann.—p. 1429.
Basic Experience of Physician. V. von Weizsäcker.—p. 1431.
Fatality After Smallpox Vaccination. F. Wernick.—p. 1434.
Therapy of Whooping Cough. M. Stirnadel.—p. 1434.
Crisis in Therapy of Tuberculosis. Bochalli.—p. 1435.
Idem. E. Brieger.—p. 1436.

Tolerance of Nurslings for Crystallized Vitamin C.—After calling attention to the great significance of vitamin C in the feeding of nurslings, Kramár shows that normal nurslings

usually tolerate fruit juices well enough so that they receive sufficient amounts of vitamin C. In certain nutritional disturbances, however, the adequate provision with vitamin C is often difficult, and for this reason the author welcomes the fact that vitamin C is obtainable in pure form. He studied the efficacy of the pure vitamin in healthy and sick nurslings and in premature infants. He found that healthy nurslings tolerate from 25 to 50 mg. daily, that new-born infants tolerate from 20 to 25 mg., and that premature infants can safely be given 15 mg. Febrile disturbances do not seem to inhibit the tolerance for the pure vitamin. Moreover, medication with the vitamin causes no gastro-intestinal disturbances, and after this had been determined the vitamin was administered to nurslings with intestinal disturbances. The author gained the impression that the vitamin had a favorable influence on the development of premature infants and also that it played a significant part in the water metabolism.

Allergic Manifestations Caused by Coffee.—Gutmann discusses the allergic manifestations caused by coffee. He describes the various methods of preparing coffee and estimates the caffeine contents of the different coffee extracts. He points out that, although small doses of pure caffeine produce palpitation of the heart, tremor, sweating, anxiety, nausea and diarrhea, coffee, or several cups of tea or of cocoa with a comparatively higher caffeine content and with theobromine, may be well tolerated. He ascribes this to the fact that in different stimulants the various xanthines are combined with different chemical substances. Caffeine for instance is combined with the tannic acid of coffee, which under the influence of hot water is split into caffeic acid and quinic acid. Moreover, the stimulating action of coffee is not solely dependent on the caffeine but also on the roasting products, which present a mixture of various chemical substances, such as furfural, pyridine and ammonia and also coffee oil, which is supposed to be the carrier of the aroma. In discussing the allergic action of coffee, the author differentiates susceptibility to caffeine from susceptibility to coffee as such. Allergic manifestations that develop after drinking coffee are itching, neurodermatitis, urticaria, Quincke's edema with particular involvement of the face, intestinal spasms with chronic constipation or, in other patients, diarrhea, also rhinitis, asthmatic disturbances, biliary colics and migraine. The author tested various types of coffee on persons who responded with such allergic manifestations. The coffee that was tolerated by the greatest number of "coffee susceptible" persons was one from which many roasting products, such as aldehyde, furfural, methyl alcohol, acetone, acetic acid, pyridine and ammonia, had been removed, while most of the aromatic substances had been retained. In the case of this coffee the greater tolerability is the result of the reduction of allergens; however, the better tolerance for caffeine-free coffee compared to ordinary coffee, which is likewise noticeable in many allergic persons, is ascribable to the fact that caffeine makes the patient more susceptible to allergic influences.

Deutsche Zeitschrift für Chirurgie, Berlin

241: 313-504 (Sept. 25) 1933. Partial Index

*Results and Experiences with Five Hundred Blood Transfusions. F. Schürer-Waldheim.—p. 332.
Circoid Aneurysm. H. Hohbach.—p. 349.
Origin and Treatment of Adhesive Pericarditis. H. W. Pässler.—p. 359.
*Pathogenesis, Symptoms and Treatment of Pylorospasm of Nurslings. P. Boecker.—p. 377.
Indications for and Results with Ileostomy After Witzel. A. Schmechel. —p. 391.
Lymphohistiocytic Skin Reaction of Kauffmann in Acute Appendicitis. E. Seifert.—p. 410.
*Osteodystrophia Fibrosa Localisata of Long Tubular Bones. H. Bremer and B. Wienert.—p. 418.
Tear Fractures of Bones of Wrist. M. Ernst and W. Römmelt.—p. 438.
Surgical Treatment of Hallux Valgus. H.-G. Ullmann.—p. 455.
Roentgenologic Recognition of Fracture of Vertebral Arch. E. N. von Oettingen.—p. 470.

Results with Blood Transfusions. — Schürer-Waldheim states that in the Graz clinic more than 500 blood transfusions were performed in the last four years with two fatal results due to faulty grouping of the donor. The method of selecting professional donors in their clinic included a general physical examination with particular attention to syphilis, malaria and gonorrhea. A Wassermann blood test was made every six weeks. To prevent fraud, each certificate of health was accompanied by the photograph of the donor. The grouping is repeated before the transfusion. The donors are reexamined every six weeks and are not used oftener than once during that period. Some of the donors were used as often as twenty-five times without any harm to them. Blood grouping by means of the "hemotest" was not infallible and for that reason Oehlecker's biologic test was carried out at every transfusion. Blood transfusions proved strikingly effective in the control of acute hemorrhage of capillary or parenchymatous nature. Surgical intervention is necessary when bleeding comes from fairly large arteries. Spontaneous hemorrhage into the intestine, the genito-urinary tract or the pulmonary tissue was effectively arrested by transfusions. In hemophiliac patients, blood transfusion combined with hypodermic injections of sodium citrate had a favorable effect on the control of bleeding. Encouraging results were obtained by the use of massive and repeated transfusions in the treatment of the tendency to bleeding in patients having long standing icterus. In chronic anemia resulting from repeated hemorrhages, transfusions of smaller amounts of from 200 to 300 cc. of blood favorably influenced the blood picture and the styptic properties of the blood. The cachectic state of patients with a malignant condition was favorably influenced by blood transfusions without, however, any effect on the rate of growth of the tumor. Transfusion was effective in combating postoperative shock, provided other and undetected causes did not operate at the same time, such as edema of the brain tissue, fat or air embolism, or a bleeding vessel. The method is applicable with good results in delayed convalescence, provided the function of the kidneys is unimpaired. Blood transfusion is absolutely contraindicated if the function of the kidneys is impaired. The results in suppurative conditions were not encouraging, but they can perhaps be improved by earlier, massive and repeated transfusions. Good results were observed in burns, and only transient improvement in diseases of the blood.

Pylorospasm of Nurslings. — According to Boecker, the older anatomic concept of the so-called pyloric hypertrophic stenosis of infants was based chiefly on postmortem evidence. The pyloric tumor was found to be the result of hypertrophy of the circular fibers of the pyloric musculature, the longitudinal fibers remaining unchanged. The newer functional concept regards the condition as a pylorospasm developing on a neurogenic basis. This concept finds support in observations made in the course of operations on these infants. It was noted that the tumor corresponded not to the pyloric but to the antral portion of the stomach. It was, in fact, a prepyloric tumor. The author points to the experience of Lehman, who found that in 10 per cent of the infants with a palpable tumor no tumor was found at the operation. Instead there existed a spasm involving the pyloric and antral portions. This condition, termed by Hurst "achalasia," is a functional disturbance in the coordination of the opening mechanism of the pyloric sphincter. For this reason, in Sauerbruch's clinic, these infants are first treated medically in the pediatric clinic. Those who do not respond are turned over to the surgical division. Fifty children were operated on for pylorospasm between 1926 and 1932. Of these, forty-six were boys and four girls. The mortality was 8 per cent. The author attributes these good results to the simplicity and effectiveness of the Weber-Ramstedt operation.

Osteodystrophia Fibrosa Localisata of Long Bones.—Bremer and Wienert report seven cases of localized fibrous osteodystrophy observed in the Cologne surgical clinic between 1920 and 1931. The patients were observed for periods of from one and a half to twelve years. The theory of a single gross injury appeared untenable, but the possibility of oft repeated insignificant injuries as an etiologic factor appeared likely. The condition first manifested itself almost invariably through a spontaneous fracture. The patients came to be treated at the ages of from 6 to 16 years. The order of frequency of localization was humerus, femur and tibia. The disease pursued the following course in their patients: In only one was there an involvement of the epiphysis with disturbance of longitudinal growth of the bone; in one, the cyst enlarged as the bone grew; in two, spontaneous fracture terminated in healing; in two, spontaneous fracture was not followed by deposition of callus,

and in two, healing of the spontaneous fracture was followed by two later fractures. The treatment consists in curetting the cyst cavity. It is impossible to explain why in some cases spontaneous fracture leads to thickening of the bone and healing, while in others thickening does not occur and an operation becomes necessary to obtain healing. The authors likewise report two cases of cyst formation in the distal end of the tibia in which the process, after a number of years, broke through the cortex and involved the soft parts and the skin with a resulting large area of ulceration. One of these patients died of metastases one year after amputation of the leg.

Jahrbuch für Kinderheilkunde, Berlin

141: 1-72 (Oct.) 1933

*Clinical Aspects and Etiology of Subcutaneous Adiponecrosis (Sclerodermia Infantum). S. A. Siwe.—p. 1.
*Treatment of Diabetes in Children. M. Weichsel.—p. 25.
Experiences with Intubation in Nondiphtheritic Stenoses. M. Hohlfeld. p. 42.
The Integrated Child: Increased Sensitivity of Sympathetic Nervous System to Psychic Stimuli. S. Ederer and J. König.—p. 46.

Subcutaneous Adiponecrosis.—Siwe shows that adiponecrosis is a process strictly limited to the fat tissues and having no influence on the general condition of the organism. He gained the impression that its development is dependent on a high palmitic acid content of the fat, but he admits that trauma (pressure during birth) may be a contributing factor. The importance of the palmitic acid content of the fat is further proved by the fact that, when adiponecrosis occurred in adults, the same composition of the fat was found. The author accepts the cellular changes in the tissue as reactions to the altered form and composition of the fat. He shows that the appearance of adiponecrosis in foci contradicts the palmitic acid theory only apparently, because the fat cells are hardly all at the same time in the same stage of development and probably do not have the same composition everywhere.

Treatment of Diabetes in Children.—Weichsel tested the efficacy of various dietary treatments recommended for children with diabetes mellitus. He found that a diet with high carbohydrate content, when given for longer periods, may impair the tolerance in cases of medium severity. The protein carbohydrate system proved ineffective, even when given only for a short time. A fat and carbohydrate diet of short duration proved favorable. In children, however, this diet (free from animal protein) can be employed only for a short time. Stolte's free diet proved inadvisable in incipient cases, but the author thinks that it can be tried in cases of medium severity. In the so-called total diabetes the free diet proved helpful in some, ineffective in other cases. The author recommends as the method of choice a diet in which the food essentials appear approximately in the ratio in which they appear in human milk. In older children the composition may be changed by increasing the fats and by decreasing the carbohydrates.

Klinische Wochenschrift, Berlin

12: 1433-1472 (Sept. 16) 1933. Partial Index

Sterilization for Eugenic Reasons. R. T. von Jaschke.—p. 1433.
Pancreatropic Substance from Anterior Lobe of Hypophysis: Demonstration and Nature of Pancreatropic Substance. K. J. Anselmino and F. Hoffmann.—p. 1435.
Pancreatropic Substance from Anterior Lobe of Hypophysis: Metabolic Action of Pancreatropic Substance. F. Hoffmann and K. J. Anselmino. —p. 1436.
Derivation of Urinary Pigments from Hemoglobin: Physiologic Decomposition of Hemoglobin. R. Nothhaas.—p. 1438.
*New Rapid Pregnancy Reaction from Urine ("Thirty Hour Reaction"). W. Reiprich.—p. 1441.
Can Read's Formula Be Recommended to Practitioner as Substitute for Determination of Basal Metabolism? H. Neumann.—p. 1444.
*Dehydrating Action of Diet Deficient in Carbohydrates and Its Therapeutic Applicability. D. Adlersberg and O. Porges.—p. 1446.
Content on Complement Fixing Antibodies in Human Organs. Alexandra Strobl and A. Wasitzky.—p. 1453.
Newer Observations on Occurrence of Imidazol Derivatives in Urine. O. Fürth and E. H. Majer.—p. 1454.
*New Gonococcic Antigen. E. Witebsky.—p. 1455.
"Serious Silicosis." L. Teleky.—p. 1456.

New Rapid Pregnancy Reaction.—The so-called thirty hour reaction described by Reiprich employs morning urine, because it contains the hormone in the most concentrated form. Following filtration and the addition of a drop of tricresol, the urine is injected under the skin of the back of infantile or juvenile rats weighing from 40 to 50 Gm. Rats of this weight tolerate from 10 to 14 cc. of urine in the course of six or nine hours, while smaller rats may die of lesser doses. As a rule, the urine is injected in two or three doses at intervals of about six (or six and three) hours. The positive reaction, which is evident thirty hours after the first injection, consists in hyperemia and enlargement of the ovaries to two or three times their normal size. The ovaries of the control animal that is given injections of urine from a nonpregnant woman remain pale and small. The reaction does not require microscopy, as it can be detected with the naked eye. However, the histologic studies that were made to determine the nature of the changes disclosed (1) intense blood perfusion of the tissues and dilatation of the vessels, (2) accelerated growth of the otherwise still small or medium sized follicles, and (3) a beginning luteinization. The author says that an accident led him to try the rat as a test animal, because in the course of experiments for other purposes he discovered the great resistance of the rat to comparatively large amounts of urine and decided to utilize this property for the pregnancy test.

Dehydrating Action of Low Carbohydrate Intake.—In studies on the dietary treatment of diabetes mellitus, Adlersberg and Porges observed that the ratio between fat and carbohydrates influences also the water exchange of the organism, and they decided to investigate this problem. They found that the carbohydrates have a water retaining action. This storage of water does not take place in the blood but rather in the tissues, particularly the skin. On the other hand, a diet deficient in carbohydrates has a distinct dehydrating action and in this manner has an antiphlogistic effect. The low carbohydrate diet can be employed with good success not only in edemas of various origins but also in inflammatory exudates, for the limitation of the quantity of sputum in bronchiectasis and, finally, as an "antiphlogistic diet" in certain inflammatory processes.

New Gonococcic Antigen.—Witebsky's antigen is prepared in the following manner: A strong suspension of various strains of gonococci is left to stand for several days in 50 per cent alcohol. Then a certain small amount of lecithin, the exact quantity of which is determined in preliminary tests, is added to the "stock antigen." The antigen is not filtered and thus consists of dissolved and nondissolved parts and should be well shaken before it is used. A measured quantity of the well shaken gonococcic antigen is put into a small porcelain dish and is evaporated in the water bath. Immediately following the evaporation, the residue is mixed with physiologic solution of sodium chloride so as to obtain five times the volume of the evaporated extract, and 0.25 cc. of this suspension serves as antigen. The test is a complement fixation and should use four different amounts of patient's serum inactivated by keeping it for half an hour at a temperature of 56 C. The serum, diluted 1:3, is put into four test tubes to the respective amounts of 0.25, 0.15, 0.1 and 0.05 cc. The difference in volumes is made up to 0.25 cc. by the addition of sodium chloride solution. Then 0.25 cc. of the antigen suspension and 0.25 cc. of 1:15 diluted serum from guinea-pigs are added. The mixtures are then placed for one hour in the incubator at 37 C. Then 0.5 cc. of a mixture of equal parts of sheep's blood suspension and of diluted amboceptor is added. The diluted amboceptor should correspond to from four to five times the dose of completely dissolving amboceptor. Then the test tubes are again incubated. Control of serum and extract is necessary. To control the serum it is sufficient to mix the largest dose of serum with 0.25 cc. of physiologic solution of sodium chloride and 0.25 cc. of guinea-pig serum diluted 1:15. Control of the extract is performed by mixing 0.25 cc. of the diluted extract with 0.25 cc. of the sodium chloride solution and with 0.25 cc. of the 1:15 dilution of guinea-pig serum. The reaction is read following hemolysis of the controls and a second time after renewed incubation of from one-half to one hour. In clearly positive reactions, even the second reading shows complete inhibition of the hemolysis. Only the reactions that prevent hemolysis in at least two dilutions of serum should be considered positive. The author employed this complement fixation test on several thousand serums. He considers the specificity satisfactory, the only difficulty being the differentiation from tuberculous processes. About its sensitivity he states that the reaction is

still negative in new infections because from two to three weeks is required before the antibodies in the serum are sufficiently characterized.

Medizinische Klinik, Berlin

29: 1331-1362 (Oct. 1) 1933

Aphasic Disturbances of Speaking Capacity and Disturbances in Understanding of Speech. E. Forster.—p. 1331.
*Foundations of Iodine Therapy in Internal Medicine. H. Liebig.—p. 1334.
Experiences with Vaginal Cesarean Section and Its Late Results. O. Hajek.—p. 1336.
*General Nervous Rheumatism: High Incidence in Girls and Women Owing to Unsuitable Clothing. R. Milner.—p. 1336.
Differential Diagnosis and Therapy of Angina Pectoris. A. Lehndorff.—p. 1340.
*Fatal Mercury Poisoning Originating in Vagina. K. Montzka.—p. 1343.
Normal and Pathologic Erythrocytic Hemogram in Persons of Advanced Age. F. Lasch and K. Triger.—p. 1346.
Structure of Retina as Foundation for Classification of Neurons. A. Kohn.—p. 1348.
New Method of Sterilization in Surgery. A. Baumgarten.—p. 1351.

Iodine Therapy in Internal Medicine.—Liebig calls attention to the fact that free iodine in solution has great affinity for living tissues and that this property is the basis of its antiseptic, hyperemic, anti-inflammatory and resorptive actions. The author shows that iodine is readily absorbed by the organism and explains its action in promoting secretion and dissolving mucin. After emphasizing the value of iodine therapy in tertiary syphilis, particularly in gummas, he discusses the practicability of iodine treatment in atherosclerosis. He describes his own studies and reviews those of other investigators on the mechanism of action of iodine in atherosclerosis. He found that iodine increases the combining power of the serum for cholesterol, and he thinks that this prevents the lipoid infiltration of the vascular intima and thus explains the action of iodine at least partially. He discusses the influence of iodine on the metabolism and particularly its effect on the thyroid. He calls attention to the value of iodine salts in the treatment of poisoning by heavy metals, especially in lead poisoning.

Nervous Rheumatism in Girls and Women.—Milner discusses a form of nervous rheumatism that is found mainly in girls and women, the incidence being five times as high in women as in men. The men who develop this form of nervous rheumatism are frequently exposed to wet and cold. The disorder becomes manifest in the form of severe pains in the legs and feet, often erroneously ascribed to flatfoot formation and wrongly treated. In the arms, the nervous rheumatism frequently leads to more or less extended pains that radiate primarily from the region of the "small shoulder joint" (acromioclavicular joint) and go through the arm, sometimes to the fingers, but also to the neck and to the upper regions of the thorax and of the scapula. When the rheumatic pains appear in the trunk, they are easily misinterpreted as results of an internal disorder and may lead to unnecessary operations. The author sees the main cause of this nervous rheumatism in the too light and unsuitable clothing worn by women, and he thinks that proper clothing is one of the main factors in the prevention and treatment of this form of rheumatism.

Fatal Mercury Poisoning Originating in Vagina.—Montzka reports a case of mercury poisoning originating in the vagina and ending fatally on the tenth day. At the site of action the mercurial preparation produced extensive corrosions with grayish-white coating, superficial necroses and, in the deeper layers, suppurative inflammations. The other toxic effects differed from those that follow the oral intake of the poison only by the absence of changes in the stomach and jejunum. The author reviews other cases of poisoning produced by mercurial suppositories or by vaginal irrigations with solutions of corrosive mercuric chloride, and he describes one case in which a man gave himself a mercurial enema to counteract an oxyuriasis. The latter case is noteworthy because it proved the efficacy of dextrose and sodium bicarbonate in mercurial poisoning. The author points out that, in the nephroses of acute poisoning by mercury, roentgen therapy is occasionally helpful. He emphasizes that mercurial poisoning from the vagina is not entirely rare but that its diagnosis may be difficult, as the patient may keep the vaginal irrigation secret because it was done for the purpose of inducing abortion. In doubtful cases the chemical analysis of the excretions may clear up the case, but it should be remembered that the elimination of 0.01 mg. is normal, since minute quantities of mercury are contained in the foods.

Zeitschrift für Immunitätsforschung, Jena

80: 181-374 (Oct. 5) 1933

*Methods of Serologic Cancer Diagnosis by Lipoid Flocculation. H. Lehmann-Facius.—p. 181.
Hemolysis, Colloidal State and Irradiation. J. Schubert.—p. 205.
Mechanism of Bacterial Agglutinin Fixation. G. Ivánovics.—p. 209.
Reaction Capacity of Cerebral Extracts with Spirochetal Antiserums. H. Gottlieb.—p. 222.
Specificity of Fibrins. H. J. Fuchs, M. von Falkenhausen and H. Kowarzyk.—p. 233.
Experimental Investigations on Chemotherapy of Pneumococcic Infections with New Quinine Preparations. M. Gundel and L. Seitz.—p. 240.
Serologic Analysis of Paratyphoid Variation (Reading Bacilli). G. Kobayashi.—p. 270.
Serologic Analysis of Typhoid Serum. K. Takahashi.—p. 274.
Thermostabile Antigens of Tubercle Bacilli and Their Homologous Antibodies. F. Pels Leusden.—p. 279.
Corroboration Reaction in Serodiagnosis of Syphilis. E. Witebsky.—p. 323.
Adsorbability of Anthracotic Bodies. L. Goreczky.—p. 336.
Aspects of Group Specific B Receptors and Their Antibodies. K. Marberg.—p. 340.
Chemotherapy of Bartonella Anemia of Rats with Compound of Arsenic and Antimony. P. Uhlenhuth and W. Seiffert.—p. 352.
*Active Substances and Functional Changes in Anaphylactic Shock. W. Zechnall.—p. 357.
Use of Alcoholic Pallida Suspensions in Serodiagnosis of Syphilis. R. R. Hoeltzer.—p. 368.

Serologic Cancer Diagnosis by Lipoid Flocculation.—Lehmann-Facius describes several methods or modifications for the improvement of the serologic diagnosis of cancer by lipoid flocculation. Centrifugation of the serum-antigen mixtures was a requirement for all these tests. The author mentions the following as the characteristics of the serologic diagnosis of malignant tumors: 1. Interventions on the antigen: in place of the primary alcoholic carcinoma extracts, certain of their fractions were used; namely, the phosphatide fraction that is insoluble in acetone and certain fatty acids. 2. Interventions on the serum: first by precipitation of the euglobulin fraction containing the antibody. In this process a further purification and an improvement of the method was obtained by the preparation of the subfraction soluble in sodium chloride. The phosphatide fraction and the cephalin fraction extracted from it proved to be suitable antigens. It was necessary to employ these extract fractions in the form of dense suspensions, which were obtained by slow dilution; in the course of the preparation, a slight lecithinization of the phosphatide extracts proved helpful. Further, intensification of the reaction capacity of the tumor serums was tried by first treating them with hydrochloric acid. Flocculability of the carcinoma serums was actually produced thereby, provided the action of the acid had been sufficiently intense. The acetone soluble fatty acid fractions of the alcoholic carcinoma extracts served as antigens. About half of the carcinoma serums that had been treated with acid produced flocculation also with a suspension of oleic acid. The inclusiveness of the reaction differed with the use of the various extracts and was independent of the histologic type of the original material. 3. The antibody nature of the reacting substances in the tumor serums was proved by separation experiments. It was found that the oleic acid suspension is capable of combining antibodies from the globulin of the tumor serums, which are separated by thermic influences and which, by a flocculation reaction, can be demonstrated again in the separation fluid.

Anaphylactic Shock.—Zechnall investigated the theories on the pathogenesis of anaphylactic shock that stress the significance of the potassium content of the serum and that assume a glycogen intoxication. He found that passively sensitized guinea-pigs show during anaphylactic shock a considerable increase of the potassium content of the serum. Potassium salts administered intravenously are eliminated from the blood stream of sensitized animals much more slowly than from that of normal animals. This proves that the sensitization process changes this function. Injection of glycogen into the blood stream does not produce anaphylactic shock in normal or in sensitized animals, and the author considers it improbable that glycogen plays a part in the pathogenesis of anaphylactic shock.

Zeitschrift für klinische Medizin, Berlin

125: 195-386 (Sept. 23) 1933

Angina Pectoris and Anoxemia. S. Dietrich and H. Schwiegk.—p. 195.
*Physical Chemical Foundations of Predisposition to Edema in Pregnancy and Obesity. E. Baráth and P. Weiner.—p. 243.
Therapy of Addison's Disease with Suprarenal Extracts. G. A. Kreuzwendedich von dem Borne.—p. 249.
*Influence of Potassium-Calcium on Blood Pressure: Blood-Cerebrospinal Fluid Barrier. W. Löwenstein.—p. 267.
Physiologic Daily Fluctuations of Leukocytes. K. L. Zirm and W. Bauermeister.—p. 282.
*Increasing Strophanthin Action by Subsequent Calcium Administration in Patients with Cardiac Decompensation. A. Böger and F. Diehl.—p. 294.
Sphygmomanometry of Korotkow's Sounds. M. Arjeff and G. Frenckell.—p. 309.
Circulation in Diabetes Mellitus. T. Streit.—p. 313.
Relations Between Symptoms of Lead Poisoning and Porphyrin Elimination on Basis of Studies on Patients with Lead Poisoning. H. T. Schreus and C. Carrié.—p. 330.
Action of Amidopyrine on Carbohydrate Metabolism. G. Krause and H. Marx.—p. 341.
Dextrose Tolerance in Hypertension. K. Jansen.—p. 351.
Denervation of Suprarenals a Promising Therapy of Diabetes Mellitus? H. Lucke.—p. 361.
Peptone Actions and Their Relations to Problems of Allergy. M. Samter.—p. 370.

Tendency to Edema in Pregnancy and Obesity.—Baráth and Weiner show that during pregnancy and in obesity a latent tendency to edema may exist in persons in whom edema is not evident. Studies carried out by von Korányi and von Farkas disclosed that disturbances in several physical and chemical factors, particularly in the equilibrium of the colloid osmotic pressure and the venous pressure, are the cause of this tendency to edema. The authors studied these factors on pregnant and on obese persons and reached the same conclusion; namely, that the colloid osmotic pressure is decreased and that thus the equilibrium between this pressure and the venous pressure is disturbed. The authors illustrate the differences in the relationship of these two factors in normal persons and in those presenting a tendency to edema by entering the values of these factors into a system of coordinates.

Influence of Potassium-Calcium on Blood Pressure.—In comparing the potassium calcium quotients of the blood and of the cerebrospinal fluid in patients having various types of hypertension, Löwenstein detected a relative increase in calcium and a relative decrease of potassium in the cerebrospinal fluid when the values were compared to the conditions found in the blood. Although the absolute numbers remain within the limits of the normal fluctuations, it may be assumed that this change in the ratio of the cations of the blood to those of the cerebrospinal fluid is not an entirely indifferent matter. There is no evidence that these changes are the primary factor in hypertension, for they imply the existence of lesions in the central nervous system. However, in case of an increased irritability of the centers regulating the blood pressure, even a slight deviation in the electrolytic composition of the cerebrospinal fluid, which of course always accompanies a change in the reaction of the fluid (normally more alkaline than the blood), may produce changed impulses in the sensitive sympathetic centers. Thus the authors believe that the electrolytes and their quantitative changes in the cerebrospinal fluid and in the blood exert an influence on the development of hypertension. The first links in this pathogenic process are probably toxic, trophic or other still unknown processes that cause changes in the composition of the cerebrospinal fluid. These changes in turn, by influencing still more susceptible centers, cause hypertension and, parallel with it, deviations in the electrolytic status of the blood.

Calcium and the Action of Strophanthin.—Böger and Diehl, summarizing the results of their studies on animals and their observations on human beings, state that calcium produces an influence on the circulation of patients showing cardiac compensation similar to that produced by digitalis preparations. A therapeutic dose of calcium, administered without digitalis, influences particularly the peripheral circulation, in that, similar to digitalis, it exerts an antagonistic action on the sympathetic nervous system. The influence of calcium on the sympathetic becomes manifest in an increase in the peripheral resistance, which, as the authors were able to show, is not due to an increase in the circulatory volume. The influence on the vagus shows itself in a considerable decrease in the frequency of the pulse which, just like that produced by digitalis, leads to a prolongation of the diastole but leaves the systole practically unchanged. The acceleration of the velocity of the pulse wave following administration of calcium, which runs parallel with the increase in the vascular tonus caused by vasoconstriction, likewise indicates the similarity of the action of calcium and of the digitalis preparations. The authors investigated whether the action of strophanthin could be increased by calcium in patients having cardiac decompensation. They found that especially in patients presenting an insufficiency of the left heart a further increase in the circulatory volume can be obtained by giving an injection of calcium after the strophanthin has been administered. This observation is especially valuable for cases in which the stasis is in the lesser circulation (for instance, in acute pulmonary edema), since by further increasing the beat volume it is possible to lead more blood from the lesser to the general circulation.

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95: 967-1012 (Sept. 14) 1933

*Roentgen Treatment of Certain Metrorrhagias. E. Husted.—p. 971.

Roentgen Treatment of Certain Metrorrhagias.—Husted concludes that roentgen treatment is indicated in cases of irregular glandular hypertrophy of the endometrium in older women, when diagnosis has been confirmed by histologic examination. In patients in the middle and late thirties, curetting of the uterine mucous membrane should be followed by expectant treatment; if recurrence sets in, roentgen treatment is in order, though possibly not until after repeated curettage. In young women, treatment should consist of possibly repeated curetting; in case of frequent recurrence or of exhaustion due to the hemorrhages, roentgen treatment should be given to bring about a temporary menostasia. Extirpation of the uterus should be a last resort reserved for the rare cases in which the hemorrhages cannot be controlled by roentgen treatment.

95: 1013-1060 (Sept. 21) 1933

*Induced Abortion on Medical Indication: Two Hundred Cases. P. Kühnel.—p. 1013.
*Later Fate of Our Eclampsia Patients. A. Olsen.—p. 1019.
Endogenic Adiposity—"Elityran." V. Brandt.—p. 1026.

Induced Abortion.—Kühnel finds that, even when performed on proper medical indications and by practiced technicians under the most favorable external circumstances, induced abortion is accompanied by a grave risk, and he states that the statistics available from Russia emphasize his point of view. There were in his material a primary mortality of 1 per cent, graver hemorrhage in 8 per cent of the cases, lesions in more than 10 per cent and infection in 18 per cent.

Later Fate of Eclampsia Patients.—From his after-examinations, Olsen concludes that neither the course of later pregnancies and births nor the patient's later state of health affords evidence for the interruption of pregnancy solely on the basis of an earlier eclampsia or eclampsism.

95: 1061-1094 (Sept. 28) 1933

Relation Between Zoster and Chickenpox. O. Haslund.—p. 1061.
*Ochronosis. O. Bouet.—p. 1064.
Occurrence of Endemic Goiter in Denmark. T. Dalsgaard-Nielsen.—p. 1067.
Change in Wassermann Reaction. J. R. Mørch.—p. 1069.

Ochronosis.—Bouet's patient was admitted for treatment of a typical carbolochronosis after daily use for three and one-fourth years of a 2 per cent solution of phenol on a large ulcer of the leg. Ulceration was present from the condyle of the tibia of the right leg to the lowest point of the tibia, with small ulcerations on the anterior and posterior parts of the knee, which was almost fixed at an angle of from 40 to 45 degrees. The entire leg was noticeably atrophied. The skin of the face and the cartilage of the ears were discolored. Roentgen examination revealed marked halisteresis of tibia and fibula. Amputation of the leg was done. The pronounced anemia, exhaustion and lack of appetite are regarded as undoubtedly due to intoxication with phenol and phenol derivatives. The increased phenol in the urine, even five or six weeks after the end of the treatment with phenol, is thought perhaps to result from elimination of phenol that may have been bound in the organism. This case, together with previously reported cases, warns that careful attention is necessary when a patient is found to have started treatment with phenol.